

# THE BRITISH JOURNAL OF DERMATOLOGY DECEMBER 1954

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## URTICARIA SOLARIS.

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URTICARIA solaris is a rare disease and much remains to be discovered as to its causation, prevention and treatment. For this reason it is hoped that the following notes of tests carried out on a case in an attempt to discover the responsible wavelength and the most effective means of prevention and treatment, may be of interest.

### CASE REPORT.

A woman aged 30 complained of irritation from sunlight "all her life".

*Past illness.*—Allergic rhinitis; occasional "heat spots"; appendicectomy.

*Family history.*—Nothing of importance. No allergy or skin trouble.

*The present complaint.*—Irritation of the skin on exposure to sunlight was first noted after the patient had had her appendix removed at 3 years of age. Very soon afterwards it was noticed that exposure to sunlight lasting more than a few minutes led to whealing. This sensitivity has never disappeared, so that the patient now dreads the sun. On the face, hands, arms and legs below the knee small nodules the size of a pea have been present for many years. These nodules are also caused by sunlight and although each one lasts only about eight weeks, fresh crops continually appear so that the patient is never free.

*On examination.*—A well-developed healthy young woman, with nothing abnormal apart from her skin.

On the face, backs of hands, external surfaces of the forearms and on the legs below the knees were numerous hard, shotty papules; many had had the tops scratched off. A few depressed scars were visible on the extremities where old lesions had apparently resolved. There was also mild acne vulgaris.

The results of all investigations were normal except that the blood showed a slight eosinophilia (7% on one occasion and 3% on another) and the sedimentation rate was 17 mm. in one hour (Westergren). Negative findings worth mentioning are the absence of porphyrins and haemoglobin in the urine to spectroscopic examination, and the failure of three attempts to transfer sensitivity passively.

Biopsy of a nodule showed the stratum corneum to be thickened, and the dermis

oedematous and infiltrated with collections of lymphocytes, plasma cells, eosinophils and endothelial cells.

In a preliminary experiment it was found that plate glass intervening between the illuminant and the skin did not delay whealing, showing that light waves shorter than  $m\mu$  320 were of little importance in producing the reaction.

#### THE ISOLATION OF LIGHT ENERGY INTO SPECTRAL BANDS.

There are two methods of doing this : one by using filters and the other by projecting a spectrum from a bright source of light. Both these methods were used in investigating this patient.

*Filter tests.*—In the beginning many tests were carried out with ordinary dyed gelatine filters, so coloured that only certain known wavelengths were freely transmitted in the visible spectrum. Both sunlight and a mercury vapour arc lamp were used as the source of illumination. After much work it was decided that the results obtained were of little value for the following reasons :

Dyed gelatine filters are usually designed to transmit certain visible wavelengths and to absorb all others. Unfortunately, this ideal is difficult to attain in practice, and many filters transmit wavebands other than those they are primarily designed to transmit.

The dyes used in gelatine filters were usually designed for industrial use and little attention has been given to those which absorb in the ultra-violet and infra-red regions of the spectrum. In general, such filters, while transmitting certain specific parts of the visible spectrum, may or may not absorb to any large extent in the near infra-red, and never absorb in the far infra-red (above  $m\mu$  1000). Care must therefore be taken when using filters that secondary transmission bands do not produce anomalous results. When this occurs it may be difficult to distinguish between the effect of the wavelength under investigation and that of the secondary transmission band. To do this it is customary to use a supplementary filter which absorbs the primary transmission band and then to evaluate the result on the basis of an arithmetic summation of effects.

Critical examination of much of the published work in which filters (dyed gelatine or glass) have been used leaves the issue uncertain. Again, the proportion of light transmitted by most gelatine filters varies considerably at different wavelengths, making it difficult to compare the effects of wavebands of equal intensity. The importance of intensity of radiation in producing wheals is shown by experiments such as the following :

Tests carried out on the outer aspect of the thigh with a mercury vapour lamp showed that with the lamp at 15 inches from the skin a wheal formed in  $3\frac{1}{2}$  minutes, and with the lamp at 30 inches from the skin a wheal formed in 12 minutes. (If it can be assumed that the lamp and apparatus showed a variation of intensity of 4 to 1 (by the inverse square law) by moving from 15 to

30 inches, then the duration of the exposures is almost the reciprocal of these intensities.)

Further, it is difficult to obtain dyed gelatine filters which transmit really narrow wavebands of sufficient intensity to produce a reaction in the skin.

It was therefore decided to abandon the use of dyed gelatine or glass filters and to carry out tests only with a special type of filter so designed that the proportion of incident light transmitted at different wavelengths is almost equal. Provided, then, that the intensity of light entering the filter is approximately equal at all wavelengths, that reaching the skin through the filter at different wavelengths must also be nearly equal.

The above characteristics are possessed by an interference filter in which the light is reflected between two partly silvered surfaces between which is interposed a substance such as zinc sulphide or any of the inorganic-organic substances which are used in the blooming processes for increasing the transmission of lens systems.

In the lens blooming process a layer is deposited on the surface of the lens by a technique involving the evaporation of the substance in a near vacuum. This layer is only a few thousands of a millimetre thick, but because of its optical nature it can increase or decrease the transmission of any specific wavelength of light providing the thickness of the layer is correctly adjusted. In the electromagnetic theory of light it is usual to refer to this layer material as a dielectric. The method of sandwiching the dielectric between semimetallized surfaces merely exaggerates this effect. Therefore, as has been indicated above, for any given thickness of dielectric there is one preferential wavelength transmitted, and by making a non-uniform deposit in the form of a wedge it is possible to obtain a continuous succession of transmission bands.

Such a filter\* was used in these experiments: it transmitted bands 40 m $\mu$  wide of wavelengths from 400 to 700 m $\mu$ ; the peak transmission was 25%.

In use, the filter was covered with thick cardboard in which circular openings were made in such a way that small isolated patches of light about 0.5 cm. diameter were transmitted.

In order to avoid the effect of heat transmission from the source of light, a piece of Calorex heat-absorbing glass was added between the light source and the filter. Typical absorption curves of this graded interference filter are shown in Fig. 1. The width of the bands is calculated as the range of wavelengths of which the intensity is not less than 50% of the brightest in the centre of the band.

As the source of illumination it was decided to use bright noonday sunlight on a cloudless summer day. This was done to make sure that the light waves of different wavelengths reaching the filter should be, as nearly as possible, of equal intensity.

\* Made by Barr & Stroud Ltd.

The ordinary mercury vapour arc lamp would, of course, have been much more convenient for experimental purposes, but was considered unsuitable because the spectral energy is distributed in a series of isolated bands instead of as a continuous spectrum, and it is difficult to determine with reliability the energy output at different wavelengths.

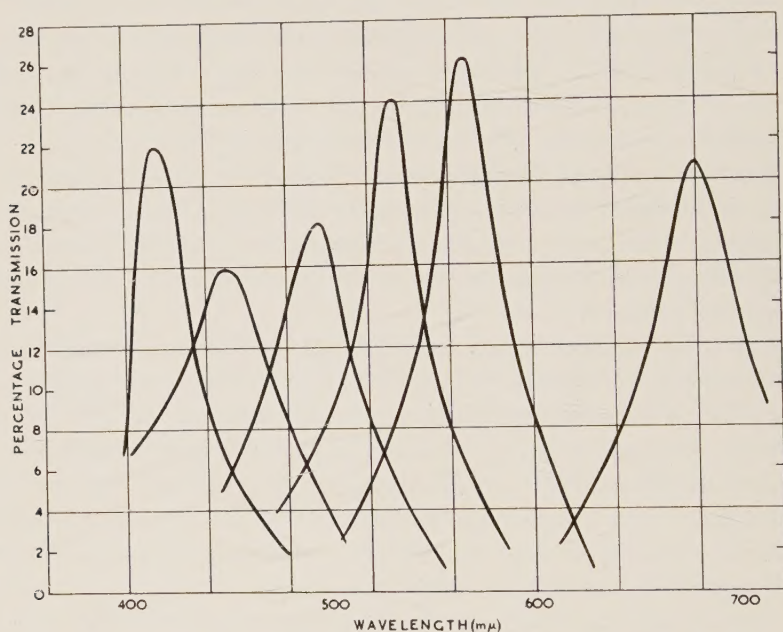


FIG. 1.—A selection of absorption curves taken at random on a graded Barr & Stroud interference filter.

The results were as follows, each reading being the average of two or more tests carried out on the flexor aspect of the forearms at noon in early June :

| Filter used               | Relative intensity of sunlight (Abbot). | Reaction time. |
|---------------------------|-----------------------------------------|----------------|
| Blue-violet (460 mμ) . .  | 92                                      | 12 minutes     |
| Green-yellow (550 mμ) . . | 102                                     | 11½ „          |
| Orange-red (600 mμ) . .   | 95                                      | 7 „            |

These figures show that although sensitivity extended throughout the visible spectrum, differences were found at different wavelengths. Each test showed slightly greater sensitivity in the orange-red region, but allowance must be made for experimental error, which is considerable in such tests.

*Spectroscopic tests.*—An entirely different, and perhaps more satisfactory, method of testing sensitivity is by using a monochromator to project a spectrum from some light source (Arnold, 1941). This was done on the inner and outer

aspects of the forearm, using a very brilliant high-pressure mercury cadmium lamp. The results were as follows :

| Wavelength<br>(m $\mu$ ). | Relative<br>intensity.* | Reaction<br>time. | I $\times$ T. |
|---------------------------|-------------------------|-------------------|---------------|
| 365 .                     | 3 (?) .                 | 9 .               | 27 (?)        |
| 405 .                     | 1.8 .                   | 6 $\frac{1}{2}$ . | 12            |
| 435 .                     | 3.3 .                   | 11 .              | 36            |
| 508 .                     | 6.2 .                   | 8 $\frac{1}{2}$ . | 52            |
| 546 .                     | 4.3 .                   | 4 $\frac{1}{2}$ . | 20            |
| 578 .                     | 4.2 .                   | 4 .               | 17            |
| 644 .                     | 4.2 .                   | 7 .               | 29            |

\* From data supplied by manufacturer.

The intensity of light was of the same order at each wavelength. The lamp used in the test was not calibrated, and it was therefore possible only to use the manufacturer's values for an average product. These experiments do at least confirm the wide range of sensitivity in this case from the ultra-violet region to the infra-red which was shown by the filter tests. Great sensitivity was found in the yellow-orange region, thus broadly conforming to the pattern of the filter tests.

*Infra-red tests.*—Tests with a Wratten 88A coloured glass filter cutting out all rays shorter than 720 m $\mu$  (this was carefully checked by a spectrophotometer) showed whealing with the long red rays from a tungsten lamp :

| Area tested.                        | Whealing<br>(minutes). |
|-------------------------------------|------------------------|
| Unprotected skin of thigh . . . . . | 4 $\frac{3}{4}$        |
| With filter . . . . .               | 14 $\frac{1}{2}$       |

These tests show that sensitivity extended into the infra-red.

#### *The Relation between Sensation of Irritation and Whealing.*

It was noticed that a sensation of irritation always preceded the formation of a wheal and that the longer the interval between exposure of the skin to light and the appearance of irritation, the longer it was before a wheal developed.

This was shown by such tests as the following, carried out with a mercury vapour arc lamp at 30 inches from the skin :

| Area exposed.                      | Time taken for<br>irritation<br>to develop<br>(minutes). | Whealing<br>(minutes). |
|------------------------------------|----------------------------------------------------------|------------------------|
| Left arm (flexor aspect) . . . . . | 2 $\frac{3}{4}$ .                                        | 4                      |
| Lumbar region . . . . .            | 3 .                                                      | 5                      |
| Back . . . . .                     | 3 $\frac{1}{2}$ .                                        | 6 $\frac{3}{4}$        |

Allowing for experimental error it may be assumed, as would be expected, that the sooner irritation is felt, the sooner will a wheal develop. Although the sensation of irritation is subjective, its onset in an observant patient is probably

as accurate a means of comparing the effect of different wavelengths as is the development of a wheal. My patient strongly objected to tests causing wheals so I decided to use the onset of irritation as the end point in certain experiments. In Fig. 2 is shown the correlation between times for irritation and for whealing. These data were obtained from many experiments under different conditions, and although there is a large spread in any one experiment there is a clear connection between the time required to elicit irritation and that required to form a wheal.

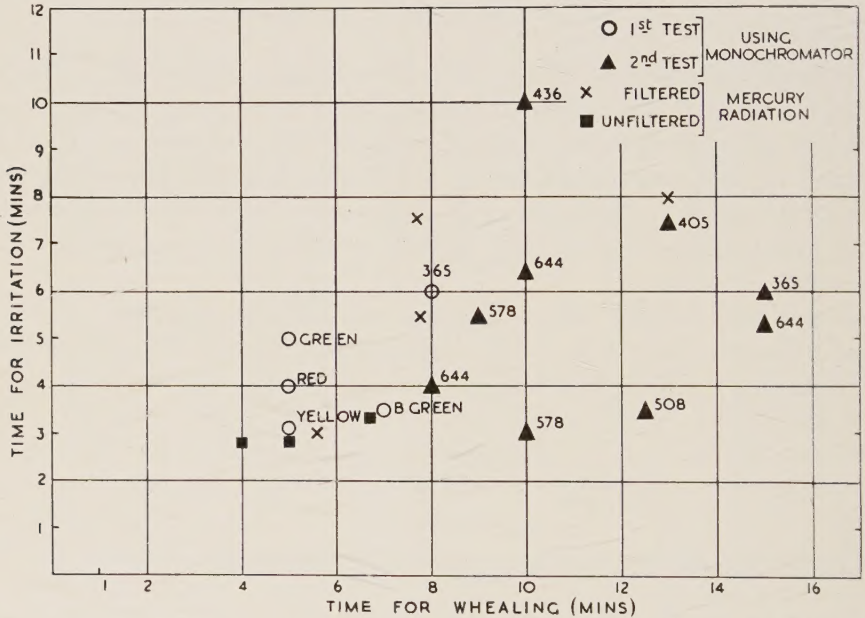


FIG. 2.—Relation between time taken to feel sensation of irritation and development of a wheal.

*Tests Showing that Sensitivity of Skin to Light is Reduced by Frequent Exposure.*

It has often been noted that skin which is frequently exposed is less sensitive to light than skin which is normally shielded from daylight, and this was so in my patient. The reduction of sensitivity produced by frequent exposure is well shown by the following example :

*Light Source : Bright Sunlight in May.*

|                        |                     |
|------------------------|---------------------|
| Area tested.           | Whealing (minutes). |
| Dorsal surface forearm | 10                  |

*Three Weeks Later (after Frequent Exposures).*

|                        |                    |
|------------------------|--------------------|
| Dorsal surface forearm | No wheal in 1 hour |
|------------------------|--------------------|

Such a reduction in sensitivity suggests a method of treatment by repeated and increasing doses of light, and patients suffering from abnormal sensitivity to light have been successfully treated in this manner. Hurst (1938), for instance, began by exposing one square inch of his patient's skin for one minute to ultra-violet radiation. As sensitivity of the exposed skin lessened, the period of irradiation was increased and the area under treatment extended until a high degree of tolerance was acquired. In my case, unfortunately, this method was unsuccessful.

*Tests Showing that Sensitivity was Specific.*

Numerous tests with a variety of substances known to irritate the skin, such as morphine hydrochloride, were made by prick and scratch tests. Histamine also was used. In no case did the response differ from that in the normal subject. Heat and cold also produced a normal reaction. Such results suggest, as reported by many others, that in urticaria solaris the sensitivity is specific for light.

*Tests for Sensitivity to Choline Compounds.*

To test the possibility of the reaction being due to release of choline compounds in the skin, 4 mg. of carbaminol-choline was given by mouth. This did not cause wheals, nor did a 0.25% solution of acetylcholine inserted by electrophoresis (anode 1 sq. inch; current, 2 m.a. for 10 minutes). Carbaminol-choline (0.25%), however, did produce a few small wheals when similarly introduced.

Pilocarpine nitrate, 1/12 grain, injected subcutaneously caused marked general symptoms, but no wheals.

Atropine sulphate, 1/50 grain, did not delay whealing on exposing the skin to light from a mercury vapour arc lamp twenty minutes later.

These results, although inconclusive, do not suggest that abnormal sensitivity to choline is responsible for the reaction.

TESTS OF SUBSTANCES USED TO PREVENT SUNBURN.

In the hope that some of the substances used to prevent sunburn might be of value in the treatment of this case, tests were made as follows:

A basic cream was made of lanette wax 15%, soft paraffin 15%, water 70%. This cream alone was found to have no effect whatever in preventing irritation and whealing. After this cream a powder was applied consisting of talcum 58%, creta praeparata 5%, zinc stearate 10%, fuller's earth q.s. and a trace of colouring matter. This method was used in the hope that a suitable powder might be found which the patient could use with her own brand of

face cream. This powder, used with the basic cream, was found experimentally to double the exposure time required for a wheal to form with bright sunlight, or the light from a mercury vapour arc lamp or from a photoflood bulb. Specific substances recommended as preventing the active rays causing sunburn from reaching the skin were then mixed with the powder and further tests carried out with the same illuminants. The substances tested were menthyl salicylate (10%), tannic acid (3%), para-aminobenzoic acid (3%), quinine sulphate (3%), aesculin (3%), salol (10%) and aluminium powder (3%). In carrying out the tests the patient used the various powders just as she was accustomed to use cream and powder on her face normally. It was felt that such tests were the only ones likely to be of practical value though no doubt differences in thickness of the powder applied were common. To overcome this error a series of tests were made with each substance added to the powder and an average reading taken.

Of the substances mentioned above, powdered quinine sulphate was the most effective. When it was added the time taken to cause irritation and whealing was 50% longer than when it was omitted. Menthyl salicylate and salol were almost equally effective. None of the other substances in the percentages quoted above appeared to be of value. Olive oil and tannic acid (8%) in alcohol, spread directly on the skin, were of some use, but less effective than the cream and powder.

No doubt the failure of these substances to prevent whealing was due to the fact that they chiefly absorb only the light waves responsible for sunburn, in the region of  $m\mu$  285 to  $m\mu$  320. My patient being sensitive throughout the spectrum, especially in the orange-red region, naturally gained little benefit from agents absorbing the ultra-violet rays alone. Some of them, indeed, such as aesculin, cause a green fluorescence, thus converting ultra-violet rays into the more active longer ones.

Finally, tests were made with the patient's own face cream and powder and these proved only slightly less effective as a physical barrier to light waves than the powder containing quinine sulphate. Only small quantities of chemicals were used in these tests so that the danger of direct irritation or allergic sensitivity developing might be avoided.

These results may have been affected by the manner in which the light-absorbing substances were used—as a powder superimposed on a basic cream. By suspending the solids directly in a cream and emulsifying the liquids in the first instance with the aid of a special agent, a more even distribution of smaller particles would probably have been produced, thus increasing the effective protection of the skin. The method used was adopted for simplicity and uniformity.

In view of these findings it was thought to be worth while to make a special cream containing those substances which had proved to be of value. Accord-

dingly Mr. E. J. Foot, chief pharmacist at Essex County Hospital, was approached, and most kindly devised and made up a cream of the following composition :

|   |                                 | %      |
|---|---------------------------------|--------|
| R | Titanium dioxide . . .          | 5      |
|   | Quinine bisulphate . . .        | 5      |
|   | P-aminobenzoic acid . . .       | 2      |
|   | Menthyl salicylate . . .        | 10     |
|   | * Base (water soluble) . . .    | to 100 |
|   | * <i>Base (water soluble) :</i> |        |
|   | Emulsifying wax B.P. . . .      | 15     |
|   | Glycerine . . . . .             | 7      |
|   | Stearic acid . . . . .          | 5      |
|   | Solution of chlorocresol . . .  | 0.1    |
|   | Distilled water . . . . .       | 73     |

The *p*-aminobenzoic acid, though not helpful in my patient, was added in the hope that the cream might be of value in light-sensitive persons generally. The cream is tinted to suit individual requirements by adding ferric oxide, carmine and orange G as required. It should be kept in an air-tight container. It spreads easily and can be washed off with water. When spread on my patient's arm in a thin layer it more than doubled the time required to produce irritation and whealing with a mercury vapour arc lamp, and more than doubled the time required to produce erythema on the arm of a normal subject.

*Antihistamines.*—When given by the mouth these drugs appeared to lessen the sensitivity of the patient's skin to sunlight, so that less irritation and whealing occurred on exposure. So convinced is she of their value that she never likes to be without a supply of tablets.

*Chloroquine sulphate.*—This also appeared to be of value in doses of 150 mg. twice daily.

#### DISCUSSION.

It appears from the cases reported that urticaria solaris may be caused by wavelengths of light between  $m\mu$  300 and  $m\mu$  800 or even longer.

The majority, however, of those in which the responsible wavelength has been identified were found to be sensitive to rays between  $m\mu$  250 and  $m\mu$  500 ; in other words, to ultra-violet radiation and the violet-blue region of the visible spectrum.

Sensitivity is apparently commoner to the longer wavelengths of this range, and examples of this have been described by Duke (1923), Wucherpfennig (1928),

Vallery-Radot *et al.* (1926, 1928), Blum and West (1937), Arnold (1941), Rajka (1942) Blum *et al.* (1946), Kesten and Slatkin (1953).

Sensitivity to the shorter wavelengths ( $m\mu$  370 or less) has been reported by Beinhaur (1925), Wucherpennig (1925), Sulzberger and Baer (1945), Ehrlich (1947), Beal (1948), Anderson (1951), Kesten and Slatkin (1953).

In my own case the active wavelengths extended from the ultra-violet region throughout the visible spectrum into the infra-red. Such a wide range of sensitivity is unusual, though a case reacting to infra-red rays was reported by Watkins (1943).

How the reaction is brought about is not known. The mechanism seems to differ entirely from that of solar erythema in which there is a long latent period followed by pigmentation and no whealing unless the dose has been excessive, and in which the active wavelengths are in the region of  $m\mu$  297.

Since light acts only when absorbed, it is important in considering the mechanism of urticaria solaris to know how much of each wavelength is absorbed in the different layers of the skin. This has been investigated by Bachem and Reed (1931), who found that in the stratum mucosum the greatest absorption occurred between  $m\mu$  300 and  $m\mu$  400, and in the corium between  $m\mu$  400 and  $m\mu$  550. The amount of light absorbed by the latter was considerably greater than by the former.

These figures correspond roughly with those quoted above for the wavelengths responsible for urticaria solaris in the majority of cases, and indicate that the amount of light energy absorbed by the cells of the skin is an important factor in producing the urticarial reaction.

It has been suggested that there are present in the skin of these patients certain abnormal compounds which are altered by the action of light, and that such changes lead to the formation of H-substance and whealing. To identify such compounds is extremely difficult and the first step would seem to be to discover the light waves causing urticaria in any particular case. Once this has been accomplished a search may be made among substances which absorb these wavelengths; for it is among them that a sensitizing agent might be found.

No satisfactory evidence, however, of the presence of such an agent has been forthcoming, whether in the nature of a porphyrin or otherwise. And in a case such as ours, which reacted to widely differing wavelengths, such an hypothesis requires the presence of a substance absorbing a long range of different wavelengths or of a number of different substances, which seems improbable.

Another possibility is that the reaction is an allergic one. This was first suggested by Duke (1923), I believe, and the concept has since been supported by a number of authors. There is much to be said in favour of such an explanation which seems to me to fit the facts better than any other.

On this hypothesis whealing may be supposed to occur as follows: Light

waves are absorbed by certain cells in the skin and act on them, so that they become sensitized. On subsequent exposure a reaction takes place within the cells leading to a release of H-substance and whealing. The mechanism of the reaction is not known, but it suggests interaction between allergen and antibody : the use of such terms may not be strictly accurate, but it facilitates discussion of the hypothesis. In favour of this concept are the following facts : The whealing observed is similar to that produced by other allergens as well as by heat and cold, and the patient is often the subject of other disorders attributed to allergy. My patient, for example, suffers from hay fever. Frequently there is a family history of allergy : the age at onset of symptoms corresponds to that of allergy in general. Passive transfer of sensitivity has been carried out successfully in certain cases (but not in mine) as in some other forms of allergy. The speed with which the reaction occurs on exposure to light is suggestive, as is also the beneficial effect of antihistamines on occasion, the number of eosinophils in the tissues and blood, and the patients' varying sensitivity to light.

Nothing is known of the supposed allergen. Sulzberger and Baer (1945) suggest that it may be a normal metabolite. Possibly it is produced in all persons by the action of light on the skin. Otherwise it is difficult to account for the transfer of sensitivity which occurs in some cases but in not all and is carried out by injecting serum from the patient into the skin of a normal person. No reaction occurs until the area is irradiated and then a typical wheal develops. To test this idea serum was withdrawn from normal subjects before and after irradiation and injected intradermally into the patient's skin. The results were ambiguous.

The nature of the supposed antibody is unknown, but it is damaged by irradiation (Ehrlich, 1947 ; Beal, 1948) by prolonged storage in the cold and by heat (Sulzberger and Baer, 1945 ; Beal, 1948). Beal (1948) speculated that it is probably a large molecule of colloid nature, since he found it to be not dialyzable through a semi-permeable membrane. Apparently light waves acting on it do not produce H-substance directly, for Ehrlich (1947) and Beal (1948) have shown that serum containing sensitizer (antibody) did not cause a wheal when irradiated and subsequently injected into the skin. The capacity to form antibody seems to be inborn, and this hereditary character appears to be the all-important factor in the aetiology ; for no matter how much a normal person is exposed to sunlight he will not develop urticaria solaris.

It is a curious fact that passive transfer has usually been successfully carried out only in cases due to wavelengths shorter than  $m\mu$  370. This suggested to Blum *et al.* (1946) that these cases may have a different mechanism from the majority. Passive transfer, however, was successful in a case belonging to the longer wave group which was reported by Rajka (1942), and in one sensitive to rays up to  $m\mu$  390, described by Sulzberger and Baer (1945). Moreover, it

has been shown by Beal (1948) that the success of a passive transfer experiment depends in part upon the susceptibility of the recipient and on whether the donor has been recently irradiated or not. These findings reveal that the response to the test is variable; it seems that no absolute distinction can be made between the two groups on the presence or absence of this quality.

Whether the substance which excites whealing is actually histamine is not known. The presence of H-substance is suggested by the finding of increased gastric acidity after irradiation (Rajka, 1942; Sulzberger and Baer, 1948) and the beneficial effect of antihistamines (Tyson, 1946; Rubin *et al.*, 1947; Ehrlich, 1947; Beal, 1948; and in my patient).

#### SUMMARY.

A case of urticaria solaris is reported in which tests to discover the responsible wavelengths were carried out with a special type of filter and by projection of spectral bands.

It was found that sensitivity extended from the ultra-violet region throughout the visible spectrum into the infra-red.

Further tests showed that quinine sulphate 3%, menthyl salicylate 10%, and salol 10% were the only agents tried which, in the concentration used, notably increased the effectiveness of a basic cream and powder as a sun screen.

Antihistamines and chloroquine sulphate proved of value in treatment.

The aetiology is briefly discussed.

I would like to express my gratitude to Messrs. Kodak Ltd., for their kindness in the application of their monochromator in their laboratories, and especially to Mr. R. B. Morris for invaluable help, given in his spare time, not only in interpreting the results of experiments but in many other directions as well.

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## AN UNUSUAL PAPULAR ERUPTION ASSOCIATED WITH LUPUS ERYTHEMATOSUS.

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EVER since the observations of Radcliffe-Crocker it has been appreciated that the various cutaneous manifestations of lupus erythematosus are legion, and it is with some hesitation that yet a further type of eruption is described. Two patients have been seen with an unusual change in the skin confined particularly to the upper part of the trunk and neck. In one patient it appeared to be the first change in what turned out to be the acute systemic illness, and in the other the eruption occurred on three or four different occasions during exacerbations of chronic systemic lupus erythematosus.

Both patients revealed similar lesions; these are uniform, oval or round papules of pale hue, often fairly closely packed. Their contour is mildly convex and their diameter never more than one centimetre. Their surface being much the same as that of the surrounding skin, it is often with difficulty that they are discerned but are more apparent when viewed tangentially or with oblique lighting. They are not associated with any subjective symptoms. An interesting feature of this eruption is that it is evanescent; like various erythematous rashes which occur in systemic lupus erythematosus, it disappears and reappears at intervals.

### CASE REPORTS.

*Case 1.*—A woman aged 47 enjoyed good health until nine months before her death, when she developed a "white, lumpy" rash on the neck and back. The lesions were painless and caused her no symptoms. Four weeks later she developed pain in the legs, hips and lower part of the back; she also complained of nausea which later was accompanied by vomiting. For this illness her doctor gave her a course of sulphonamides; after a period of three weeks in bed her digestive symptoms had improved but the pains continued. She then noticed a peculiar pricking sensation in the skin of the hands, arms, legs and feet which heralded the appearance of an erythematous rash in these areas. Discrete at first, it soon became confluent and later appeared on the nose, cheeks and forehead. Her doctor thought this reaction to be a manifestation of sulphonamide sensitivity.

When first seen, in February 1952, she presented a typical appearance of subacute systemic lupus erythematosus: the rash was blotchy, papular and of a livid hue. In addition there was a strange papular eruption, which had been the first feature of her illness, concentrated around the neck and upper part of the trunk. The papules were pea-sized, convex and only slightly elevated above the surrounding skin. Their colour was perhaps paler than the normal skin and they could best be discerned when viewed from the side (Fig. 1).

On further examination it was found that the lymph glands were enlarged in the neck, axillae and groins, but were not tender. The spleen also was enlarged three

fingers' breadth below the left costal margin. She had lost a stone in weight over the past six months. Her blood pressure was 170/106.

*Investigations.*—The relevant abnormal findings were a secondary anaemia, marked leucopenia (1,600 W.B.C. per c.mm. was the lowest count); thrombocytopenia (90,000 per c.mm.); hyperglobulinaemia (Alb. 1.9, Glob. 3.9 g.%); E.S.R. 50 mm. in one hour. L.E. cells were not demonstrated after repeated attempts using different methods. The urine contained much albumin, a few casts and white cells. Biopsy of skin from an erythematous papule showed typical changes of subacute systemic lupus erythematosus.

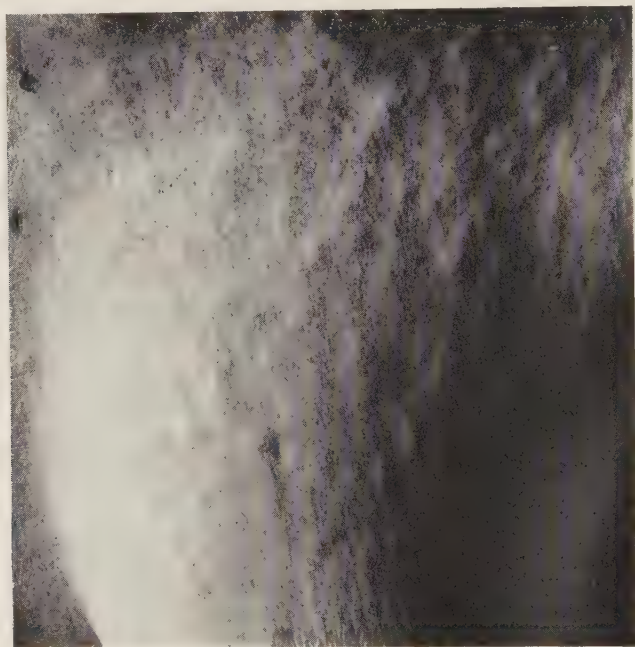


FIG. 1.

*Course.*—On admission to hospital she appeared to improve initially without specific treatment. A course of salicylates (80 grains daily) seemed to improve the rash and was effective in reducing arthralgia. Mepacrine (100 mg. twice daily) was started on 10 June 1952, and after three days it seemed that the rash was extending and oedema developing. On the 17 June the mepacrine was reduced to 100 mg. daily, but after a further four days it was apparent that she was rapidly deteriorating so the drug was withheld. ACTH (100 mg. daily in divided doses) was started on 26 June, but by then large blisters had developed over the erythematous areas; she became comatose. There was no clinical response to ACTH and she died on 29 June with a widespread bullous rash.

*Autopsy* revealed typical changes of systemic lupus erythematosus in the spleen, kidneys, lungs and lymph nodes.

The unusual papular eruption had been watched carefully during this patient's illness and it was found to fluctuate widely from week to week, sometimes becoming scarcely visible.

*Case 2.*—A woman aged 41 had tuberculous cervical adenitis as a child and had always developed chilblains readily. Discoid lupus erythematosus first appeared on

her face twenty years previously, and later spread to the backs of the fingers and arms. She had received many courses of treatment including bismuth injections, gold injections and sulphonamides; the rash frequently responded satisfactorily to various methods of treatment. In 1938 she had a severe attack with pain and stiffness in her joints and since this time the rash had never completely cleared. In 1946 she developed a dark red "lumpy" rash on her waist and thighs which was thought to have been urticaria from penicillin injections. More recently her scalp has become increasingly involved and the lesions of the face progressively atrophic. Over the past few years she has been aware of "white lumps" on her back and chest, with one on her left breast; these would appear only when she was having an exacerbation of lupus erythematosus, caused her no symptoms, and would regress when the attack subsided. They were skin-coloured or pale papules of variable size but not larger than a pea; on the back they were packed quite closely together. They were seen more readily when viewed from the side. There was no suggestion of a follicular arrangement. In association there was a generalized livedo reticularis of the back, the papules being situated in between the meshes of the cyanotic network.

General examination revealed typical atrophic lupus erythematosus involving the face, scalp, fingers and toes. She was stiff in many joints and pain was a feature, particularly in the ankles and knees. She suffered from marked loss of energy.

*Investigations* revealed moderate anaemia: E.S.R. 32 mm. in one hour; L.E. cells were not found in peripheral blood; urine was normal; W.B.C. 6000 per c.mm. (normal differential); no thrombocytopenia; serum proteins Alb. 3.6, Glob. 5.2 g.%.  
(*Course.*—Since 1951 she has had one period of hospital treatment because of an exacerbation of arthritis in her feet. This responded to administration of salicylates. The lupus erythematosus is now quiescent and she leads the life of a chronic invalid.

This patient is obviously an example of chronic systemic lupus erythematosus following a benign and prolonged course. The fact that the white papular eruption has appeared on three successive occasions associated with severe attacks in 1932, 1938 and 1951, later to disappear during remissions, is a remarkable feature.

Histological reports on these unusual lesions were as follows:

*Case 1.*—"The epidermis is thin and the rete pegs less well-developed than is usual even for the sternal region. There is no hyperkeratosis, the keratin layer being thin and splitting readily. There is no basal layer degeneration. No hair follicles are present in the section; sweat glands appear normal. The dermis is profoundly altered: the mucoid ground substance is prominent, the collagen bundles are breaking up, and especially in the superficial third the two elements are fusing to form a lavender-staining material. Perivascular and peri-adnexal infiltration is slight but widespread. At the dermo-subcutaneous junction two capillaries have cuffing by relatively prominent infiltrates, containing many plasma cells. There is no fibrinoid, no basophile material and no vasculitis." (Dr. Bernard Lennox.)

*Case 2.*—"The only abnormality that can be seen in this skin biopsy is an increase in the ground substance between the collagen fibres of the dermis. This ground substance gives a strong metachromatic reaction with toluidine blue. The exact interpretation of this finding is uncertain." (Dr. N. F. C. Gowing.)

Case 1 may be legitimately described as a typical example of acute systemic lupus erythematosus. The part played by sulphonamides in the pathogenesis of this condition has previously been pointed out (Gold, 1951). The failure to demonstrate L.E. cells after many separate attempts is an interesting, but not particularly unusual feature. Smith (1952) has previously noted that occasionally these cells cannot be demonstrated in quite typical cases.

Case 2 appears, from the clinical association of progressive atrophic lupus

erythematosis affecting particularly the " chilblain areas " with arthritis of the rheumatoid type, to be an example of the chronic systemic illness. The exacerbations which have occurred from time to time always subside and this suggests that the sytemic illness is being successfully held in check.

### DISCUSSION.

The intercellular cement substance may be divided into :

(1) Tissue fluid consisting of water containing crystalloids, proteins, metabolites and gases, which is closely related to plasma and approximately reflects its constitution.

(2) The afibrillar ground substance whose most characteristic components are glyco-proteins (protein-carbohydrate complexes) which are related to fibroblastic activity.

This cement substance was first investigated by Bensley (1934) but it has subsequently occupied the close attention of many workers. It is a homogeneous amorphous, viscid material in a complex colloidal, gel-like state ; in adult tissues it is present in small quantities around connective tissue fibres and abundantly around arterial elastic membranes ; in a condensed form, enclosing argyrophil fibres, it forms basement membranes (Gersh and Catchpole, 1949). It is possible that this ground substance exists in a polymerized state and that its degree of polymerization varies. It may be in a state of flux in both normal and diseased tissues which implies that, although chemically inert, it is structurally organized at a submicroscopic and molecular level, so that its consistency may vary through reorientation of individual micelles. It is probable that the variability of this physical state may be achieved by synthesis ; possibly by secretion by fibroblasts of essential glyco-proteins ; and by enzyme activity (collagenases, hyaluronidases, etc.) causing depolymerization and consequent reduction of viscosity.

This ground substance, though present in healthy tissues, is not normally made apparent by routine laboratory stains. It stains metachromatically with toluidine blue but it is as yet undecided whether metachromasia indicates an increased amount or some alteration of its physico-chemical state. It has been shown (Altshuler and Angevine, 1951) that any substance of large molecular weight with free acid radicles may induce metachromasia with appropriate stains ; such an increase occurs during serous inflammations and has been interpreted as indicating an increase in mucopolysaccharides ; this seems to occur irrespective of the type of injury inflicted or whether it be generalized or localized, and is especially apparent in tissues with a poor blood supply, in tissues which show an increased glycolysis, and in those from which hyaluronic acid can be readily extracted.

In the " collagenoses " there are remarkable increases in amount and altera-

tions in character of this ground substance widely distributed throughout the body. In lupus erythematosus "fibrinoid" change of vascular tissue in the skin is infrequent and when it does occur it is in association with similar changes of dermal collagen; often the vascular endothelium remains surprisingly intact. Rarely the dermal connective tissue is involved and then a most striking picture results—the intercellular cement substance becomes visible and eosinophilic, while the collagen fibres become swollen, rigid and stain characteristically. With progression these two elements fuse into a homogeneous mass which, in extreme degrees, may form separate basophilic clumps making it impossible to differentiate the several dermal components one from another.

The variability of all the many different skin lesions of systemic lupus erythematosus probably indicates a fluctuating process occurring in the tissues. This may be correlated with the variability of such objective signs as the degree of leucopenia, anaemia, albuminuria, L.E. cells and hyperglobulinaemia, all of which reflect different aspects of a disturbance of the normal immune mechanism (Gold, 1953).

An interesting feature in the second case was that her "chilblain circulation" dictated the development of cutaneous manifestations predominantly in these areas. Over her back there was a well-defined livedo reticularis and the papular lesions consisting of an increase in ground substance developed in the centre of these meshes. It is probable, therefore, that deposition of the ground substance has been influenced by local vascular tone. In no specimens could "fibrinoid" be demonstrated, but it is possible that had the ground substance changes persisted for sufficiently long it would have appeared. The significance of these white papular lesions described in these patients is uncertain, but their histological appearance suggests that we are observing the earliest of connective tissue changes that occurs in systemic lupus erythematosus—a process that may well be reversible.

#### SUMMARY.

A papular eruption has been seen occurring on the neck and upper part of the trunk of two patients with systemic lupus erythematosus. These lesions disappear and reappear from time to time and seem to indicate the degree of activity of the disease. The striking histological feature is a localized increase of ground substance.

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## TURBAN TUMOUR

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CYLINDROMATA occurring on the head in such numbers as to cover the scalp more or less completely are commonly called turban tumours. Individual tumours vary in size from a few millimetres to four or five centimetres in diameter and may be grouped like bunches of tomatoes. The tumours grow slowly and are benign.

Ancell (1842) was the first to report this condition. His patient was a woman aged 52, who developed tumours on the scalp at 15 years of age. Her grandmother, sister and two sons were similarly affected. The next case reported was in a man aged 53 (Poncet, 1890). The tumours, some of which were the size of a fowl's egg, were present on the body and face as well as on the scalp. They were first noticed when he was 26 years of age, and had slowly increased in size. No other member of the family was affected. Many of the larger tumours were removed surgically and were histologically typical cylindromata.

Ronchese (1933) found a total of 31 cases reported up to the end of 1932 and himself reported a case in a man aged 68, whose mother and daughter were both affected. I have found 15 cases reported since 1932 (Guimaraes Porto, 1935; Schlamadinger, 1935; Ormsby, 1935; Hval, 1936; Schuermann and Weber, 1937; Zakon, 1939; Gabarro and Baker, 1945; Cooper, 1946; Juvin and Massia, 1947; den Hoed, 1948; Bodenham, 1949; Coloviras and Gery, 1951; Hagemann, 1951). This brings the total of cases reported to 47, of which 30 occurred in females and 17 in males. In about one-third of the cases other members of the family were also affected and the disease is a simple mendelian dominant stronger in the female sex.

Gabarro (Gabarro and Baker, 1945) appears to have been the first in this country to treat turban tumour by removal of the scalp followed by grafting. His patient also had some tumours confined to the mid-line of the upper part of the back. My first case was the next to be treated by this method and the operative procedures have been separately reported (Bodenham, 1949). The only other recorded case treated by this method was in America in 1947 (Goldman, 1951); this was the case which Cooper (1946) reported, but at first this patient refused operation. At the end of the last century Spiegler's case (1899) was treated by removal of the tumours one by one and Thiersch grafting.

In 1892, Brooke in this country and Fordyce in America both called attention to a disease in which curious new growths of benign nature, the size of a

pin's head to a pea, appeared chiefly on the face, scalp and upper part of the chest. The disease was first noticed at puberty, and other members of the family were affected. They described the condition independently, but their observations were remarkably similar and it is obvious that they were describing the same condition. Brooke used the name *epithelioma adenoides cysticum*, and Fordyce called the disease multiple benign cystic epithelioma of the skin. They described similar histological pictures of circumscribed masses of basal type epithelial cells in the dermis surrounded and limited by fibrous tissue; cysts, thought by them to be produced by degeneration of some of the cells, were present in most of the clusters of cells. Fordyce traced downgrowths of epidermal basal cells forming the tumour masses, and showed by photomicrograph the very close histological resemblance to rodent ulcer.

The histological picture in turban tumour is identical with that of Brooke's disease described above except for an eosinophilic limiting membrane surrounding the clumps of epithelial cells, which is present only in the former disease. The tumours in Brooke's disease never become larger than 4 or 5 mm. in diameter.

The histogenesis of these cylindromata is not yet clearly established. It is generally accepted that they are derived from basal epidermal cells. Some authors have observed connections of the tumour masses with hair follicles (Stillians, 1933; Schlammadinger, 1935; Ormsby and Montgomery, 1948). Others, however, regard it as a sweat gland tumour (Davies, 1928; Jones *et al.*, 1932). An origin from the sebaceous glands has also been suggested (Ronchese, 1933; Cooper, 1946). Hval (1936) considers that the tumours arise from the apocrine sweat glands. Many authors consider that the tumours are in fact naevi (Stillians, 1933; Binkley, 1938; Cooper, 1946; Pautrier, 1947).

The eosinophilic limiting membrane surrounding the groups of cells was first described by Adamson (1918): attention has been called to it in a number of cases of cylindroma, distinguishing this condition histologically from epithelioma adenoides cysticum (Ormsby, 1935; Schuermann and Weber, 1937; Binkley, 1938; Zakon, 1939; Cooper, 1946; Coloviras and Gery, 1951).

#### CASE REPORTS.

CASE 1.—The patient was a widow aged 58, an Anglo-Indian who had lived in the Central Provinces of India from 1894 to 1948. She said that she had developed a small lump on the right side of the neck when she was 16 years of age. This did not increase in size until later, when other lumps appeared. When she was 38 she noticed a small lump on the right side of the scalp and shortly afterwards another appeared in the region of the umbilicus. About three years later that on the scalp had grown to the size of a walnut and the other was the size of a tangerine orange. These were excised. By the age of 44 many other small lesions, the size of a pin's head, were present on the scalp, forehead, temples, ears and nose. Within a few months others appeared on the upper abdomen, back and genital area. She said

that the tumours grew much more rapidly after the menopause, which occurred at 48 years of age.

The lumps had never been painful, nor had they ulcerated. She complained of generalized pruritus, worse at night.

She had had cholecystitis twenty years before and at operation a large stone had been removed.

The family history obtained from the patient was vague and unreliable, as she had lost contact with her relatives and even her own family, except for one son and daughter. She was the fourth child in a family of six consisting of four girls and



FIG. 1.

two boys. Her own family was of four boys and three girls: it appears that no other member of the family was affected.

The patient was a grotesque sight with her turban tumours and large tumours on the body (Fig. 1). She was poorly nourished and had the dark skin of an Anglo-Indian. A foul rancid odour was noticed on approaching her. There was no clinical abnormality of the heart, lungs or other viscera and the blood pressure was 145/75. The superficial lymph nodes were of normal size and consistency. The skin was infested with scabies.

The blood Wassermann and Kahn reactions were negative. The blood urea was 36.6 mg.%, and blood cholesterol 190.5 mg.%. The blood count was normal except for a moderate neutrophilia.

The scalp was covered with growths varying in size from a pin's head to 5 cm. in diameter. The larger tumours were red, translucent, and of the consistency of a ripe tomato. Large telangiectatic vessels were coursing over them. The smaller

lesions were flesh coloured and raised slightly above the surface. The ears were covered with similar masses, some of which were the size of a walnut. The larger tumours were pedunculated and compressed. An unpleasant rancid smell of stale sebaceous secretion was very noticeable. A certain amount of hair was still present growing from the scalp between the tumours.

On the face growths were present varying in size from a pin's head to a split pea concentrated chiefly in the centre of the face and on the eyelids.

On the trunk there were six tumours, 2 cm. in diameter, in the interscapular region and numerous small ones scattered over the back. On the front of the body six tumours, 4 to 6 cm. in diameter, were situated at the lower costal margin; smaller

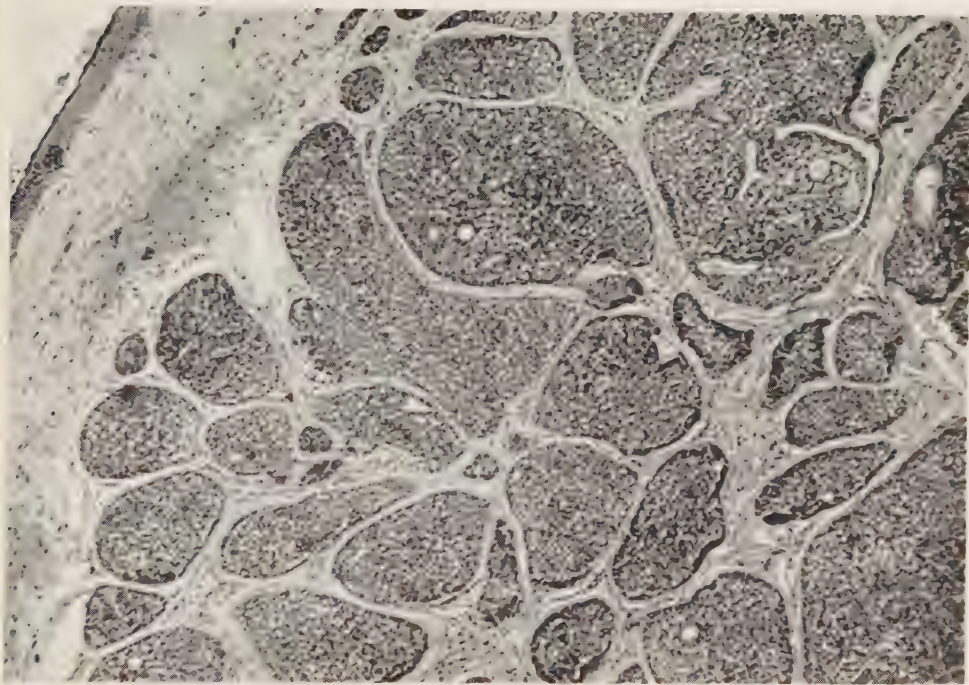


FIG. 2.

ones were scattered over the lower part of the chest and the abdomen. One tumour was present in the centre of the lower abdomen, another over the symphysis pubis, and an oblong tumour  $3\frac{1}{2} \times 5$  cm. grew from the left labium majus. There was a right paramedial cholecystectomy scar which was well healed.

In all situations on the body the small growths moved freely under the skin, and the larger ones were pedunculated. Some of those on the back, which were commonly pressed upon when sitting, were flattened.

*Histology*—Small lesions from the occipital and the interscapular regions were examined. The histological appearance was similar in both sections and further biopsies taken later were all found to be similar. The sections were stained with haematoxylin and eosin (Fig. 2). The epidermis was thin and the interpapillary pegs were few, elongated and curved. There was an increase of pigment in the basal layer, which was to be expected in a dark skinned person. In the dermis

were spherical, oval or irregular cell masses. The cells were round or oval and took up the basophil stain readily, especially the nuclei. Within the cell masses were areas of pink-staining hyaline-like material giving the appearance of cysts. At the periphery of the masses the cells were arranged in palisade manner and stained rather more deeply than those in the centre. Surrounding the cell masses was amorphous eosinophilic material similar to that found in the "cysts" (Fig. 3).

*Treatment.*—The treatment adopted was excision of the principal tumour-bearing areas of the left side of the scalp down to the pericranium under a general anaesthetic. The ear and a small area of skin below it were removed at the same time. The extensive raw surface of the pericranium and deep tissues was covered with large split skin grafts taken from the thighs. The other side of the scalp and the right ear were removed and grafted about seven weeks later. The grafts took well, and four months later the skin of the end of the nose, bearing a number of tumours, was

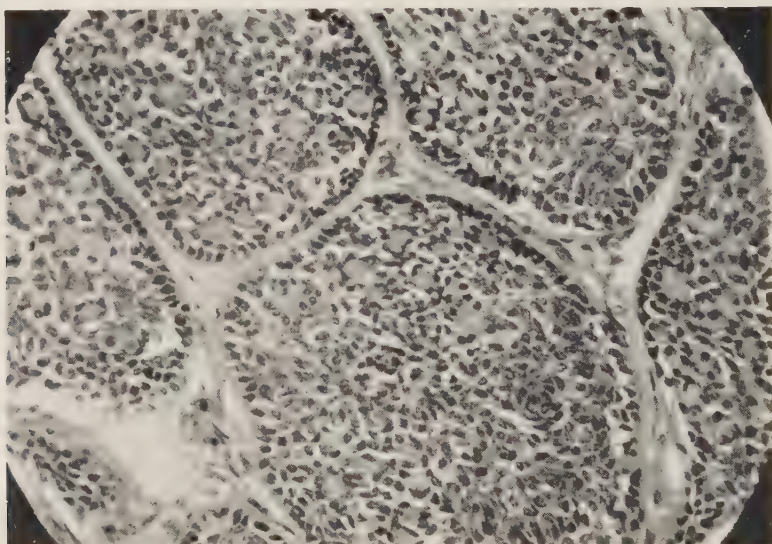


FIG. 3.

removed and grafted. At the same time the larger tumours on the abdomen, vulva and back were excised. She was discharged from hospital wearing a wig.

Two years after the first operation ten further tumours were removed from the front of the trunk and six from the back. These tumours had been present when she was first examined and had increased in size during the two-year period of observation.

The change in her mental outlook following the first three operations was most striking. On admission to hospital she had been a recluse on account of her grotesque appearance: when she was discharged she was cheerful and very grateful, and she had obtained employment for the first time in many years.

**CASE 2.**—This patient was a housewife aged 43. When she was 23 years old she first noticed small tumours all over the hairy scalp which had gradually increased in size ever since. She was the eighth child in a family of six girls and three boys. No other member of the family was affected, nor as far as she knew were her parents or grandparents.

She was well nourished. No clinical abnormality was found except for the scalp, which was covered with tumours varying in size from a pin's head up to 3 cm. in diameter. The tumours were more prolific over the frontal and vertical regions of the head and the larger ones had vessels coursing over them. The tumours were not so red or soft as the larger ones present in Case 1 and the epidermis was not stretched to the same extent over the tumours. They were confined to the scalp (Fig. 4).

The same investigations were carried out as in the previous case with normal results. The biopsy showed the typical histological picture of cylindroma.



FIG. 4.

Surgical treatment was carried out as in the previous case. Under a general anaesthetic the whole scalp, except the occipital area, was removed down to the pericranium and Thiersch grafts applied, which took well. Two months later 30 tumours on the occipital scalp were excised. The few small ones remaining are to be excised later when they become big enough to interfere with the fit of the wig which she wears. She is very well pleased with the result.

#### EFFECTS OF X-RAY IRRADIATION.

In order to study the effects of x-ray on these tumours, two of them about 2 cm. in diameter on the abdomen in Case 1 were marked A and B respectively.

Plaster models were made of them and a biopsy taken from each. The following doses of x-rays were then given:

| Tumour. | Date.                        | Kv. | Filter.                        | Number<br>of<br>doses. | Individual<br>dose. | Total. |
|---------|------------------------------|-----|--------------------------------|------------------------|---------------------|--------|
| A       | 6.vii.48                     | 95  | 2 mm. Al                       | 1                      | 2575 r              | 2575 r |
| B       | 13.vii.48<br>to<br>4.viii.48 | 140 | 0.25 mm. Cu<br>and<br>2 mm. Al | 10                     | 300 r               | 3000 r |

Two months after irradiation there was no appreciable difference between the size of the lesions and the plaster casts taken before treatment. Lesion B had ulcerated slightly and was tender. Further biopsies were performed: The superficial layers of the dermis were disorganized and an increased number of fibroblasts were present. Surrounding the vessels an infiltrate, composed chiefly of small round cells and some polymorph leucocytes, was seen. The cell masses of the tumour were completely disorganized and the formerly pronounced pink limiting membranes around the masses were in places only faintly seen. Those cells which had not disintegrated into hyaline debris were pale staining and had lost their nuclei. All these changes were more marked in the superficial part of the dermis, and indicated that the tumour cells were disintegrating and being replaced by fibrous tissue.

Five months after x-ray therapy the lesion A had disappeared completely, leaving a small white scar surrounded by an area of increased pigmentation, similar to that seen after radiotherapy of a rodent ulcer. The larger lesion was about one-quarter of its original size, and a further biopsy was performed. This showed that the epidermis was thin and atrophic with few rete pegs; a great increase of pigment was seen in the basal layer of the epidermis, presumably due to the x-ray. Abundant young connective tissue was seen in the dermis, but the inflammatory reaction seen in the previous section had disappeared. The tumour cell masses were again well defined, and the pink surrounding membrane was again present but was corrugated in conformity with the shrinking of the enclosed cell masses. There was an increase of fibrous tissue separating the tumour masses. Many of the tumour cells themselves stained well, and the cells at the periphery of the masses showed an orderly arrangement but were cuboidal or flattened rather than columnar; the central cells were small and distorted as if by mutual pressure. Some areas of hyaline degeneration were scattered throughout the masses. The tumour cells were apparently recovering from the effects of x-ray.

It seems clear that x-ray irradiation is not a practical method of treatment for these tumours. Ronchese (1933) irradiated the whole scalp of one of his patients without benefit. The dose is not stated but it produced temporary hair loss.

## HISTOLOGICAL INVESTIGATION OF THE LIMITING MEMBRANE.

Binkley (1938) considered that the limiting membrane around the clumps of cells was formed by degenerate connective tissue. He found that it took up the blue stain, in the same way as connective tissue, when sections were stained with water blue, acid fuchsin and molybdc acid.

Investigations of sections from the tumours of Case 1 were carried out in order to determine the identity of the substance forming this membrane.

Microscopic examination of sections was carried out using polarized light. The material was not birefringent and was therefore not collagen or keratin in crystalline form; collagen is stained red by van Gieson's stain, but was not present in this membrane in these sections. The periodic acid-Schiff stain (as modified by Hotchkiss, 1948) was positive, suggesting that the material might be a glyco-protein.

It may be that the substance is a secretion of the cells of the tumour. The Schiff stain supports the suggestion of the presence of a secretion of the type of glyco-protein or glyco-lipoid.

## EXPERIMENTS TO TEST FOR CARCINOGENS IN TURBAN TUMOURS.

Extracts of the tumours, which are histologically very similar to basal-cell carcinomas, were made in acetone and benzene. One hundred and sixty mice of mixed colours, half male and half female, were obtained and the fur on the backs was clipped short from the occiput for half-an-inch. The mice were divided into four groups and painted respectively with acetone extract, acetone, benzene extract and benzene, twice weekly for ten months. The skin in the experimental area of every mouse which died during the experiment was examined histologically. A second experiment was then carried out with 20 extract-painted mice and 20 control animals from the first experiment. Cages were constructed, each having 20 small compartments and a wire mesh cover which confined the mice with the painted areas of the back uppermost to be exposed to ultra-violet light. Irradiation was carried out twice weekly for 20 minutes at a distance of  $8\frac{1}{2}$  inches. This produced severe erythema of the clipped areas and the ears. Only nine mice survived the eight months' irradiation and they were then approximately two years old. No mouse developed a tumour in the experimental area during the whole course of the two experiments.

Certain changes, similar to those seen in senile hyperkeratosis of the human skin, were found in sections of the extract-painted animals but not the controls in the first experiment, and also in all the animals exposed to ultra-violet light. The normal three or four layers of well-formed cells of the epidermis were replaced by a thickened hyperplastic epidermis. These thickened areas

were composed of many layers of cells which were larger, less well defined and poorly differentiated as compared with normal epidermal cells. In the dermis there was a chronic inflammatory reaction of granulation tissue infiltrated with inflammatory cells. These changes suggest that pre-cancerous dermatoses were produced by the extracts and by ultra-violet light but frankly malignant changes were not seen.

#### PATHOGENESIS.

It is suggested that these tumours are naevoid and that they are derived from the primary epithelial germ cells which differentiate from the stratum germinativum at about the third month of foetal life to form the hair, sebaceous and apocrine glands. If the differentiation of the cell-rest is towards hair follicles then benign trichoepithelioma (Brooke's disease) will develop; if towards the sebaceous gland type then it will form the cutaneous lesions of adenoma sebaceum (Pringle); and the apocrine gland type will produce cylindroma. In support of this suggestion of naevoid origin is the occasional appearance of these diseases early in life. Trichoepithelioma was present in a boy aged 5 years described by Goldsmith and Freudenthal (1935). The frequency with which these diseases first appear at puberty also supports the idea of naevoid origin; it seems probable that the increased hormonal secretion which occurs at this time plays an important part in stimulating these cell rests into activity.

#### SUMMARY.

Two cases of turban tumour are described. Both were treated by removal of the tumour-bearing areas of the scalp followed by Thiersch grafting. The large tumours scattered over the body in one case were excised.

The histological pictures of Brooke's disease and turban tumour are identical except for the membrane surrounding the clumps of tumour cells in the latter disease. This membrane is probably composed of a glyco-protein or glyco-lipoid secreted by the tumour cells.

X-ray treatment, with doses just sufficient to cure basal cell carcinoma, severely disorganized the tumours but did not cure them. Five months after treatment the tumours were beginning to recover their normal histological appearance.

An experiment to test for the presence of cutaneous carcinogens in the tumours was carried out with extracts of the tumours painted on to mice. No malignant tumours occurred but pre-malignant changes were seen. Subsequently experimental and control mice from this experiment were exposed to large doses of ultra-violet light and again pre-cancerous changes were seen but no malignant tumours appeared.

It is suggested that turban tumours may be naevoid in origin and arise in cell rests from the stratum germinativum of the foetus in those cells which would normally form apocrine glands.

I am indebted to Mr. D. C. Bodenham for operating on my two patients. Dr. C. H. G. Price of the University of Bristol Medical Research Laboratory allowed me to keep the mice in the animal house and gave me many helpful suggestions with the animal experiments. I also wish to thank Mr. F. D. Murphy for referring Case 2 to me.

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## TUBERCULOSIS VERRUCOSA CUTIS AMONG CHINESE IN HONG KONG.

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IN the United Kingdom, the commonest tuberculous manifestation in the skin is lupus vulgaris. Tuberculosis of the skin, especially lupus vulgaris, is generally considered to be rare in the tropics, and as far as lupus is concerned this is true for Hong Kong, only one case having been seen in two years. However, warty tuberculosis of the skin is by no means uncommon and 22 cases were seen among 1526 skin cases between December 1950 and December 1952 (Table I). This condition would appear to be relatively commoner in Hong Kong and South China than in other parts of China. Heimbürger and Young (1940) state that in North China it is only one-quarter as common as lupus vulgaris and is seen in doctors, butchers and coolies. Tyau (1924) reported only two cases of verruca necrogenica among 5000 skin cases in Shanghai.

TABLE I.—*Skin Tuberculosis seen at Outpatient Clinics,  
December 1950—December 1952.*

|                                        | Cases. | Per cent. |
|----------------------------------------|--------|-----------|
| Tuberculosis verrucosa cutis . . . . . | 22     | 1.44      |
| Lupus vulgaris . . . . .               | 1      | 0.06      |
| Scrofuloderma . . . . .                | 5      | 0.33      |
| Tuberculides . . . . .                 | 2      | 0.13      |
| All other skin diseases . . . . .      | 1496   | 98.04     |
|                                        | 1526   | 100.00    |

Chin (1924) of Harbin found that tuberculosis of glands was the commonest form of tuberculous disease; tuberculosis of the skin was the second most common (forming 18.3% of 1705 cases) followed by bones, lungs and joints in that order. He makes no mention of the particular form of skin tuberculosis encountered, and it may well be that lupus is common in Harbin, which, situated in Manchuria, has a climate in no way comparable with that of Hong Kong. He adds that "as the Chinese do not drink milk, the source of infection must be human". Scrofuloderma is common in Hong Kong, almost certainly very much commoner than tuberculosis verrucosa cutis, but few cases were seen in the skin department owing to their being treated in other departments.

### CLINICAL FEATURES.

Tuberculosis verrucosa cutis is in Hong Kong seen most commonly in the young; in over half the cases of the present series the onset was before the

tenth year. It was seen in its commonly described dry warty type, in the wet type described by Morrow (1883), and in various intermediate forms: a few cases showed a circinate configuration with an almost psoriasiform appearance, though on closer examination the verrucous nature of the lesion could always be distinguished. In some cases, marked keloidal scarring was associated with the lesions, and in 12 cases the related lymph glands were involved. Biopsies performed in two cases showed the gland to be tuberculous. The patches were single in 16 cases and multiple in 6; five patches was the largest number observed in any one individual. The commonest site was on the buttocks and lower limbs. (Table II).

TABLE II.—*Tuberculosis Verrucosa Cutis.*(a) *Age at onset:*

| Age (years):    | 0-5 | 5-10 | 10-15 | 15-20 | 20-25 | 25-30 | over 30 |
|-----------------|-----|------|-------|-------|-------|-------|---------|
| Number of cases | 7   | 4    | 3     | 3     | 0     | 0     | 3       |

(b) *Distribution of lesions:*

| Site:             | Neck. | Upper limb. | Buttocks. | Lower limb. |
|-------------------|-------|-------------|-----------|-------------|
| Number of lesions | 2     | 8           | 10        | 16          |

The chest was x-rayed in 18 cases: In one case a tuberculous primary complex was found: of the other 17, 13 were radiologically clear, and in the remaining 4, old tuberculous lesions judged to be inactive were found. In one case, tuberculosis of the spine (no longer active) co-existed with the skin lesions: in another, cystic tuberculosis of the talus, underlying a patch of warty tuberculosis on the dorsum of the foot, was demonstrated radiologically. The sedimentation rate was estimated in 8 cases, and was raised in 5 and normal in 3. Biopsy of the lesion was performed in all but two cases, and the appearances seen conformed to the classical descriptions.

There seems little doubt that the disease arises by direct inoculation. Pulmonary tuberculosis is rampant in Hong Kong, and the habit of spitting is deeply ingrained in the Chinese race. When one finds that the commonest sites for the disease are the buttocks and lower limbs, and one sees, in the poorer districts, large numbers of children with naked buttocks and legs playing upon pavements liberally bespattered with tuberculous sputum, the origin of the disease is not far to seek.

An interesting case occurred of a child, who from birth had worn a large metal ring round his neck in order to bring good luck. He had been looked after by an *amah* who suffered from pulmonary tuberculosis. In addition to a tuberculous spine, this child had widespread lesions including two on the back and sides of the neck, where the metal ring had rubbed against the skin. The breaks of the skin surface due to trauma from the ring had evidently provided a portal of entry for the tubercle bacillus (Fig. 1).

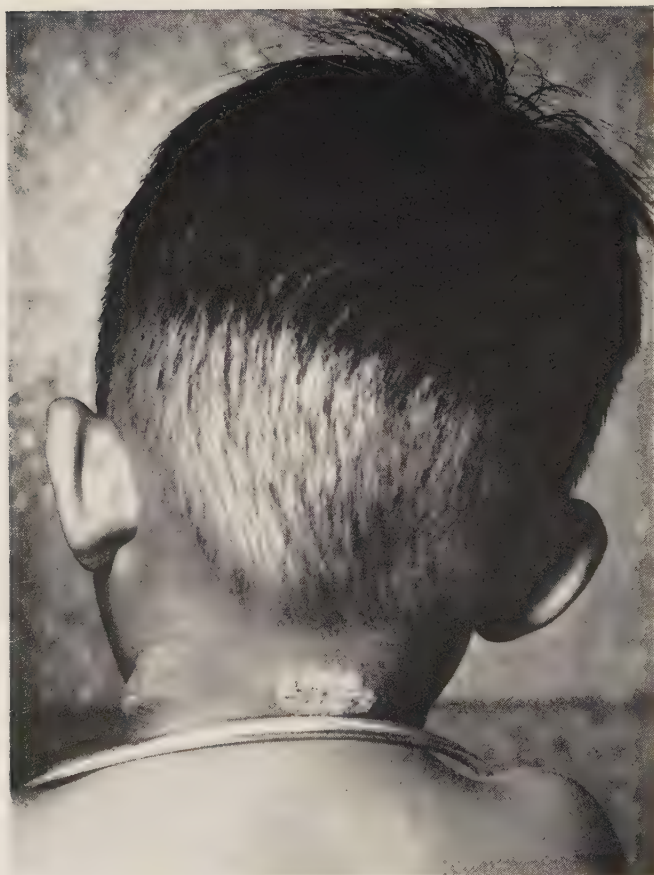


FIG. 1.

#### TREATMENT.

Treatment by local infiltration with streptomycin was found to be most effective. The lesions were infiltrated with 1 g. of dihydrostreptomycin dissolved in 10 c.c. of 1% novocain either twice or thrice weekly. PAS was given at the same time in some of the cases.

Table III shows the results of treatment. Four cases were treated with calciferol and 13 with streptomycin; 4 cases defaulted and one case successfully treated with streptomycin and isonicotinic acid has been omitted. In every case treated with streptomycin a rapid and marked improvement of the condition was produced, the time under treatment being from 4 to 12 weeks, whereas with calciferol the 3 cases in which comparable results were obtained required treatment for 12 to 16 months. In the 13 streptomycin cases, healing with only residual erythema and scarring was achieved in 8 cases; in 3 cases,

TABLE III.—*Results of Treatment of Tuberculosis Verrucosa.***Calciferol.**

| Age<br>(years). | Daily<br>dosage<br>(units). | Duration of<br>treatment<br>(months). | Result.                                 | Follow-up.                                    |                                                         |
|-----------------|-----------------------------|---------------------------------------|-----------------------------------------|-----------------------------------------------|---------------------------------------------------------|
|                 |                             |                                       |                                         | Interval since<br>last treatment<br>(months). | Result.                                                 |
| 7               | 50,000—<br>150,000          | 15½                                   | Healed with keloidal<br>scarring        | 4                                             | No recurrence.                                          |
| 4               | 50,000                      | 16½                                   | Healed                                  | 3                                             | Small area relapsed.<br>Responded to strepto-<br>mycin. |
| 17              | 150,000                     | 6                                     | Improved                                | —                                             | —                                                       |
| 22              | 150,000                     | 12                                    | Healed with slight<br>keloidal scarring | 5                                             | No recurrence.                                          |

**Streptomycin.**

| Age<br>(years). | Streptomycin<br>total<br>(grams). | PAS<br>daily<br>(grams). | Duration of<br>treatment<br>(weeks). | Result.                                                   | Follow-up.                                                                            |                                                                              |
|-----------------|-----------------------------------|--------------------------|--------------------------------------|-----------------------------------------------------------|---------------------------------------------------------------------------------------|------------------------------------------------------------------------------|
|                 |                                   |                          |                                      |                                                           | Interval after<br>last treatment<br>(months).                                         | Result.                                                                      |
| 28              | 24                                | 12                       | 12                                   | Vast improvement                                          | 16                                                                                    | Slight local<br>relapse.                                                     |
| 16              | 27                                | Intermittent             | 9                                    | Healed                                                    | 14                                                                                    | No recurrence.                                                               |
| 21              | 25                                | 12                       | 8                                    | "                                                         | 6                                                                                     | No recurrence.                                                               |
|                 |                                   | (6 days/week)            |                                      |                                                           |                                                                                       |                                                                              |
| 14              | 21                                | 10                       | 8                                    | "                                                         | 12                                                                                    | Slight local<br>recurrence.                                                  |
|                 |                                   | (6 days/week)            |                                      |                                                           |                                                                                       |                                                                              |
| 35              | 4                                 | None                     | 4                                    | "                                                         | —                                                                                     | —                                                                            |
| 19              | 15                                | "                        | 8                                    | "                                                         | —                                                                                     | —                                                                            |
| 10              | 20                                | 8                        | 7                                    | Healed with<br>keloidal scarring                          | 16                                                                                    | No recurrence.                                                               |
|                 |                                   | (6 days/week)            |                                      |                                                           |                                                                                       |                                                                              |
| 55              | 20                                | 12                       | 6                                    | Vast improvement                                          | —                                                                                     | —                                                                            |
| 19              | 30                                | None                     | 9                                    | Improved. Much<br>keloid formation<br>Apparently inactive | 3                                                                                     | Still much keloi-<br>dal overgrowth.<br>Scar abraded by<br>trauma. Inactive. |
| 44              | 13                                | "                        | 7                                    | Healed                                                    | 8                                                                                     | No recurrence.                                                               |
| 40              | 20                                | "                        | 7                                    | Vast improvement                                          | Treatment stopped owing to<br>loss of employment and con-<br>sequent undernourishment |                                                                              |
| 44              | 20                                | 12                       | 7                                    | Healed                                                    | —                                                                                     | —                                                                            |
|                 |                                   | (6 days/week)            |                                      |                                                           |                                                                                       |                                                                              |
| 10              | 15                                | 6                        | 5                                    | "                                                         | —                                                                                     | —                                                                            |
|                 |                                   | (6 days/week)            |                                      |                                                           |                                                                                       |                                                                              |

although the lesions had almost disappeared, the condition was judged to be still active; and in 2 cases healing was accompanied by troublesome keloidal scarring. Of 7 streptomycin cases followed up for periods varying from 3 to 10 months, 2 cases showed minor relapses at 12 months and at 16 months.

The impression formed from the small number of cases treated with streptomycin was that, although the end result is probably no better than with older methods, it is much more rapidly achieved. The method has other advantages over calciferol, in dealing with a largely illiterate section of the population, in that with the injection one can be certain that the treatment has been given.

## SUMMARY.

The not uncommon occurrence of tuberculosis verrucosa cutis among Chinese is reported from Hong Kong.

The disease was found to be commonest in the young, and the parts most frequently affected were the buttocks and lower limbs.

Results of treatment by local infiltration with streptomycin were encouraging.

My thanks are due to Professor A. J. S. MacFadzean, in whose department much of the work was carried out ; to Professor Hou Pao-chang, and Dr. O. K. Skinsness for their help with histological sections, and to the former for permission to publish the photographs ; to Dr. S. C. Fong for his assistance ; and to the Director-General, Army Medical Services, for permission to publish.

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# KERATODERMA PUNCTATUM SYPHILITICUM : REPORT OF A CASE.

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DISCRETE, hyperkeratotic, centrally pitted lesions of the palms and soles of syphilitic aetiology are somewhat rare.

The first morphological description of this entity which we have found was given by Cazenave in 1843 in his textbook *Traité des Syphilides*. He described small, round, slightly raised papules presenting firm, central, white, horny formations which could be picked out with the finger-nail, but which more often penetrated the thickness of the skin like a wedge. Around this horny material there was a 2 to 3 mm. zone of distinctive colour.

Duhring (1877) stated : " sometimes the upper layers of the epidermis covering the sole, and less frequently the palm, become the seat of small punctate epithelial concretions, from which corneous masses may be dug out ; or they are perforated with minute holes, with clear-cut, punched-out edges. The condition constitutes the Syphilide Cornée of French writers". Finger (1888), Brocq (1892), and Stokes (1926) described a similar entity in their texts. Respighi (1894) found punctate keratotic lesions of the palms and soles in a two-year-old child associated with severe stigmata of congenital syphilis. Bryčev and Smelov (1926), and Vadja (1928) presented cases of acquired syphilis manifesting this form of keratoderma ; also Moncorps (1927, 1928) presented a case of a twenty-eight-year-old man showing the typical clinical picture of keratoderma punctatum associated with secondary syphilis, the keratoderma disappearing 56 days after the institution of neoarsphenamine therapy. Milian (1936) is given credit for naming this condition *syphilide kératosique ponctuée*.

Numerous reports have been published concerning the idiopathic or naevoid variety of keratoderma punctatum. This condition was simultaneously described in 1879 by Davies-Colley under the title of " Disseminated Clavus of

the Hands and Feet", and by Besnier of whose case there is no report but of which there is a moulage (No. 560) in the museum of the *Hôpital Saint-Louis*, entitled "*Kératodermie érythémateuse symétrique des extrémités, forme ponctuée. Kératose localisée à l'ostium sudorifère. Paume de la main*" (Balzer and Germain, 1905; Balzer, 1925). Excellent contributions to this subject have been made by Hallopeau and Claisse (1891), Buschke and Fischer (1910), Brauer (1913), Chalmers and Kamar (1917), Galloway (1918), Matsumoto (1918), Sweitzer (1923), Balzer (1925), Lieberthal (1926), Michael (1933), Petráček (1935), and Scott, Costello and Simuangco (1951).

In addition to syphilis, other dermatoses can produce the identical clinical picture of keratoderma punctatum including: Lichen planus, Darier's disease, porokeratosis of Mibelli, keratoma periporale of Gans (1924), verruca vulgaris, arsenical keratoses and drug eruptions (e.g., streptomycin, according to Joulia *et al.* (1950)).

#### CASE REPORT.

*History.*—A 33-year-old white married man, an engineer, was first seen on 24 April 1954. During the previous six months he had developed on his palms and soles, and on the volar aspects of his fingers and toes, asymptomatic, firm "warts" presenting central plugs and pits. Some of these plugs were either spontaneously extruded or picked out of their sockets by the patient, thereby leaving deep, punched-out 1 to 2 mm. pits with smooth bases. The patient said that he had had many more such lesions on his palms, and that they disappeared spontaneously during the first month of his ailment. In the five months' period prior to being seen by us, the remaining lesions remained unchanged.

The patient further stated that at the time of the first eruption on his palms and soles in November 1953 he had laryngitis with severe hoarseness. At that time he also noted tender subungual lesions which became asymptomatic in one week. Following a period of quiescence, he noticed a patchy alopecia, and recurrence of the hoarseness in March 1954, five months after the onset of his illness. As he was a blood donor serological tests for syphilis had been performed at intervals, and for the last time about one year prior to being seen by us; they were all negative.

There was no history of a previous genital lesion or of antisyphilitic therapy. No family history of a similar condition could be obtained, and the patient denied any arsenical intake.

*On examination.*—The palms and soles, and the volar surfaces of fingers and toes, revealed numerous non-scaly, discrete, hyperkeratotic, firm papules, from 3 to 10 mm. in size and raised 1 to 2 mm. above the surface of the surrounding skin. Some of these papules showed white or yellow, horny, central plugs resembling millet seeds embedded into small craters, and others presented punched-out pits of about 1 to 2 mm. in diameter, with smooth bases. There was a very faint erythematous halo surrounding a few of the papules. The lesions were symmetrically distributed and showed no tendency to coalesce, nor were they confined to the creases of the palms and soles. Point pressure on the papules caused no discomfort. Some of the lesions, especially on the soles, were in the healing stage and showed the remains of pits but no hyperkeratosis (Fig. 1).

Several of the finger- and toe-nails showed discrete subungual hyperkeratoses and transverse ridging of the nail plates. The mucous membranes, genitals and remaining cutaneous surfaces were normal.

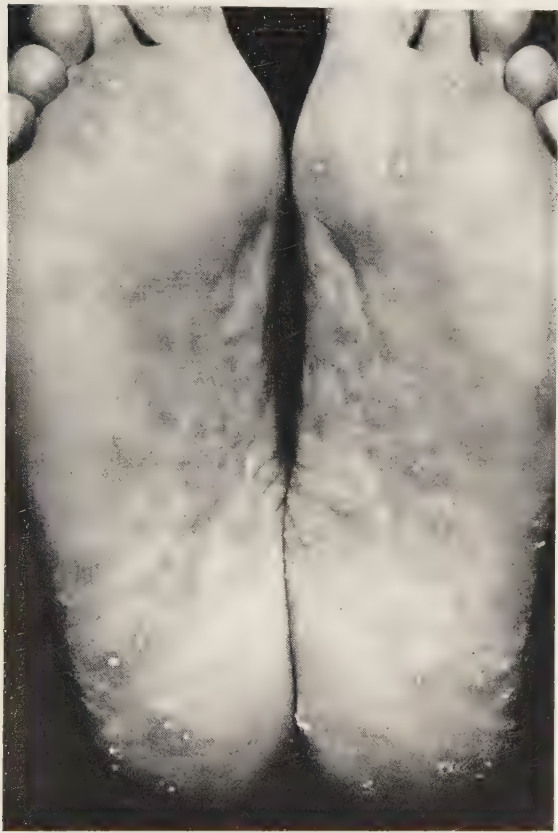


FIG. 1.

*Laboratory Findings.—*

Serological tests for syphilis :

|                                                |                    |
|------------------------------------------------|--------------------|
| Mazzini . . . . .                              | 80 units.          |
| VDRL—cardiolipin . . . . .                     | 112 ..             |
| Kline exclusion . . . . .                      | 112 ..             |
| Rein—Bossak cardiolipin . . . . .              | 112 ..             |
| Cardiolipin complement fixation . . . . .      | 1024 ..            |
| Immune-adherence test (Nelson, 1953) . . . . . | Strongly positive. |

Cerebro-spinal fluid :

|                                            |                |
|--------------------------------------------|----------------|
| Cells . . . . .                            | 14 per cu. mm. |
| Protein (trichloracetic acid) . . . . .    | 23 mg. %.      |
| Protein (sulphur salicylic acid) . . . . . | 12 mg. %.      |
| Colloidal gold . . . . .                   | 0000000000.    |
| Cardiolipin complement fixation . . . . .  | Negative.      |

The biopsy specimen (Fig. 2) of one of the papules on the sole shows a large plug formed by parakeratotic cells arranged in concentric laminated rings, reminding one of an onion cut in cross section. This horny plug pushes into the epidermis to

produce a cup-like invagination. At the base of the plug the epidermis shows an absence of the granular layer, thinning of the prickle cell layer and loss of rete pegs. Just below the plug, in the uppermost layers of the subjacent epidermis, two small oval spaces are seen which represent cross-sections of a sweat duct lumen. The epidermis to the sides of the plug is normal. There is a patchy perivascular cuff-like infiltrate throughout the cutis, more concentrated in the upper one-third, composed of many plasma cells and fewer small round cells. Some of the capillary walls are thickened. The sweat glands and ducts in the deeper cutis appear normal, but between them there is a mild infiltrate of plasmocytes and small round cells, as

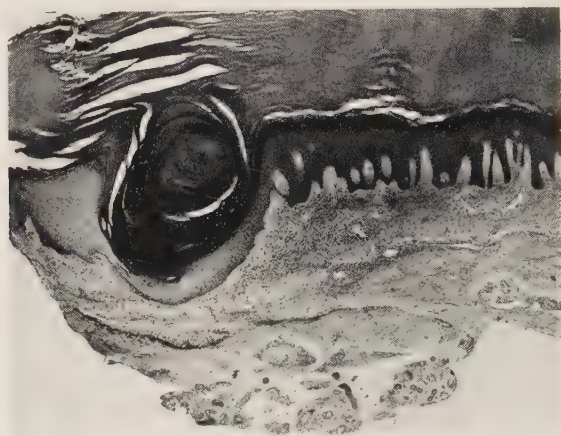


FIG. 2.—H. & E.  $\times$  23.

well as a fibroblastic reaction. No treponemes were seen with the Warthin spirochaete stain (Lillie, 1948).

*Course.*—The patient was treated with 9,000,000 units of penicillin over a period of fifteen days. Ten days after the onset of treatment, the papules became softer and flatter and the pits more shallow. Gradually the lesions disappeared, and five weeks after treatment was started no hyperkeratotic papules remained, but a few shallow pits were still visible.

#### COMMENT.

Discrete palmar and plantar keratoses of syphilitic aetiology have been described by the French under the titles of "*Syphilide squameuse cornée*" (Cazenave, 1843) and "*Syphilide cornée*" (Fournier, 1873), and by the German school as "*Clavi Syphilitici*" (Lewin, 1893). Cazenave's description included psoriasiform palmar and plantar lesions, as well as the variety showing central plugs and pits. In the other early descriptions no mention of central plugs could be found, but in one out of 28 cases Lewin found small oval dells in the hyperkeratotic lesions. Cases subsequently reported in the literature under these titles have shown a variety of clinical pictures. Confusion has arisen in these cases since some had central pits and plugs, while others did not. The

present authors therefore feel that the term *keratoderma punctatum syphiliticum*, coined by Milian, should be used when one is confronted with discrete centrally pitted palmar and plantar keratodermas of syphilitic origin.

Our case fits in with the description of *keratoderma punctatum* and we feel that morphologically it cannot be differentiated from the naevoid variety. At the time the patient was seen no other clinical manifestations of secondary syphilis were found, and the true diagnosis was established only after serological and histological examinations. In regard to the latter, *the epidermal changes are identical with those seen in the idiopathic forms of keratoderma punctatum, but the perivascular plasma-cell infiltrate and thickening of vessels are not seen in the non-syphilitic punctate keratodermas.* Except for the report of Schmidt (1929) who described inflammatory changes in the cutis, there is no cellular infiltrate in the idiopathic variety.

As we mentioned previously, *keratoderma punctatum* can be a manifestation of various diseases. It seems probable that the similarities of these efflorescences are based on the anatomical structure of the palms and soles, since centrally pitted hyperkeratotic papules are practically unknown in other areas. When one is confronted with a case of *keratoderma punctatum* an effort should be made to reach an aetiological diagnosis with the help of serological and histological examinations, and careful search should be made for coexistent dermatoses and for a history of arsenical intake.

#### SUMMARY.

A case of *keratoderma punctatum syphiliticum* is described which clinically presented numerous palmar and plantar hyperkeratotic papules with central plugs or punched-out pits. The results of the serological tests for syphilis and the immune-adherence test of Nelson were strongly positive. Histological changes consisted essentially of a parakeratotic plug, thickening of the dermal vessels, and a perivascular plasma-cell infiltrate. The lesions responded to penicillin therapy.

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# ROYAL SOCIETY OF MEDICINE.

## SECTION OF DERMATOLOGY.

President.—Dr. REGINALD T. BRAIN.

18 February 1954.

### **Naevus Anaemicus (Voerner).—Dr. I. MARTIN-SCOTT.**

Miss J. K—, aged 15.

*History.*—From the age of seven this girl has had small white patches above the right ankle which form a pattern like the fronds of maiden-hair fern. The areas are symptomless, but are said to be extending.

*Examination.*—*General*: The patient is a healthy girl with no other congenital abnormalities. *Local*: The pale areas show no abnormality of texture and are not bounded by hyperpigmentation. Tactile sensations are normal and the areas do not react abnormally to sunlight. On expressing blood from the surrounding skin the patches cannot be defined.

*Histology.*—The sections from a biopsy across a peninsula of white skin showed no abnormality.

Experiments support the theory that the condition is due to a localized vasoconstriction of the arterioles.

*Comment.*—This girl's naevus appears to be a vascular one, and not due to depigmentation, as it disappears when the capillaries of the normal surrounding skin are emptied by pressure or constricted by chilling or the action of adrenaline. Furthermore normal production of melanin is seen histologically and there does not seem to be any visible abnormality of the vessels either in number or structure.

Several writers have suggested that the condition is due to a disorder of vascular innervation in which there is a permanent tonic vasoconstriction. In 1944 Piorkowski produced an artificial naevus by the method of iontophoresis of 1/1,000 solution of epinephrine hydrochloride, and found that this gave the same experimental reactions as a natural naevus anaemicus.

The following simple experiments seem to support this view that the naevus is due to localized permanent vasoconstriction:

(1) A stick of carbon dioxide snow was applied for eight seconds to an area which included naevus and normal skin. After 7 minutes the normal skin was bright pink whereas the area occupied by the naevus became purple and congested: The whole area was slightly oedematous. At the end of half an hour the oedema of the normal skin had largely disappeared but there was still slight swelling of the naevus.

From this experiment I concluded that after 7 minutes there was a reactionary flushing of blood into the normal tissues which was sufficient to overcome the pressure caused by the oedema. In the area of the naevus however the arterial dilatation was deficient, and the resulting cyanosis was produced by stagnation of venous blood held *in situ* by the tissue oedema as in a chilblain. This incomplete dilatation later interfered with the absorption of tissue fluids.

(2) To overcome this apparent vasoconstriction 10 mg. of hexamethonium bromide was injected subcutaneously in the affected area. This caused an immediate erythema of the normal skin, but the naevus only became bright pink after a lapse of 5 minutes.

At the end of 15 minutes the normal skin was still flushed, but the outline of the naevus started to reappear in a paler shade of pink.

This experiment seemed to supplement the previous one in that the hexamethonium took longer to overcome the excessive vasoconstriction in the area of the naevus; and as its action wore off the naevus showed pallor earlier than the normal skin.

The facts that the injection was made subcutaneously and that the naevus was unchanged by the surface intunction of rubefacient creams suggested that the constriction was in the arterioles and was not confined to the superficial capillaries.

I feel that these experiments lend further support to the theory that the naevus anaemicus is due to a tonic localized vasoconstriction of the arterioles supplying the skin.

If it is agreed that such a localized permanent vasoconstriction can occur in the skin is it not possible that it might also develop in viscera such as the brain or gut and perhaps account for some of the unexplained symptoms and signs found in general medicine?

### **Incontinentia Pigmenti (Bloch-Sulzberger Anomaly).—Dr. E. J. MOYNAHAN**

This girl was born on 12 March 1951. On 17 March an herpetiform eruption was noticed on the right thigh and small vesicles were also present on the left wrist and on the buttocks. Three days later the eruption reappeared after apparently clearing and on 20 March there was a red exfoliated area in each axilla and the rash on the thighs and legs was distinctly urticarial.

On 21 March 1951 when seen by me the child had generalized exfoliation which was not ichthyotic and the urticaria had almost faded. On 28 March there was practically no evidence of exfoliation, but pustular lesions were visible in both axillae. She was discharged the same day and a note was made that skin lesions still continued to appear.

On 28 April there was a papular rash on the thighs at approximately the sites which are now pigmented; she was seen by me on 2 May 1951 when I thought the condition was lichen planus. On 30 May the lichenoid papules faded and two months later the skin was virtually clear. On 30 July she now had pigmentation at many sites, including those which had papular lesions before. The skin now showed bizarre pigmented striae and these have remained more or less unchanged since that date.

*Family history.*—Her mother appears to have had a similar condition with brown striae, mainly on the legs, from early infancy until perhaps as late as 10 or 12 years old, after which the lesions disappeared. There was no history of any febrile illness during her pregnancy. She had, in fact, been followed up from 14 September 1950 until the birth of the child on 10 March 1951.

**Dr. MOYNAHAN:** This seems to be a clinically straightforward case and the only point is that I have been able to observe the condition almost from the beginning. When I saw the child she had a generalized exfoliation. I do not know if that has been described before. She had herpetiform lesions which became infected but they cleared up with local treatment. I did not see the child for about a month and then there were lesions like lichen planus on the chest, in the axillae and on the face. These faded and left the brown pigmentation which you now see. Since then other striated pigmented lesions have appeared but no other lesions. She has no other ectodermal defects.

It is interesting that the child's mother had the same condition for the first ten years of life and that it cleared spontaneously. It has been suggested that some illness of the mother late in pregnancy, a virus infection, might cause the eruption in the foetus or the child, but there is no evidence for that.

**Dr. WALLACE:** How long do they usually take to resolve?

**Dr. H. HABER:** The longest case I know is nineteen years.

Of other cases shown the following have been published in *Proc. roy. Soc. Med.*, **47**, 653:

**Case for Diagnosis. Nodular Moniliasis of Tongue.**—**Dr. R. BOWERS** and **Dr. I. WHIMSTER.**

**Hodgkin's Disease with Collagenous Nodules.**—Dr. N. A. THORNE (for Dr. BRIAN RUSSELL).

**Chromoblastomycosis.**—Dr. K. D. CROW and Dr. R. W. RIDDELL.

Also the following cases were shown :

**Ainhum.**—Dr. R. V. GRANGE (for Dr. BRIAN RUSSELL).

**Leprosy.**—Dr. D. I. WILLIAMS.

(1) **Acrosclerosis.** (2) **Bullous Pemphigoid.**—Dr. R. T. BRAIN.

## NORTH OF ENGLAND DERMATOLOGICAL SOCIETY

Sheffield, 17 April 1954

**Sarcoidosis.**—Dr. P. D. C. KINMONT.

A man aged 51.

In January 1950 he complained of swelling of the right wrist joint. Skiagram showed a small cyst at the lower end of the ulna.

In July 1953 he developed a brownish papular eruption on the chest, back and upper parts of the limbs which did not irritate. His general health was good. Since then there has been a gradual extension of the eruption to the back of the neck, face and down the limbs, and the original lesions are gradually disappearing.

*Examination.*—There are closely-set brownish lichenoid papules on the face, back of the neck, chest, back and limbs. Some lesions are annular with a raised shiny edge, and pigment remains at the site of healed lesions.

The tip of the spleen is palpable. No other abnormality.

*Investigations.*—

|                    |             |                                      |
|--------------------|-------------|--------------------------------------|
| Mantoux reaction : | 27.xi.53 :  | 1/10,000 weak positive.              |
| „ „                | 17.ii.54 :  | 1/10,000 negative.                   |
| „ „                | 23.ii.54 :  | 1/1,000 moderately strong positive.  |
| „ „                | 13.iii.54 : | 1/1,000 negative.                    |
|                    |             | 1/10,000 moderately strong positive. |

W.R., blood urea, serum proteins, serum calcium, all normal.

*Skiagram.*—Hands : There is a large cyst of the lower end of the right ulna which has increased considerably since January 1950. In addition, there are small cysts of the bases of both first metacarpals, of the head of the right third metacarpal, of the base of the middle phalanx of the right little finger and of the head of the middle phalanx of the left little finger. I think these changes are probably due to sarcoid.

Chest : Normal.

*Histology.*—There is no significant abnormality of the epidermis. In the corium there is a patchy but profuse infiltration by histiocytes, mostly of the epithelioid type seen in sarcoidosis. They are associated with giant cells but there is no caseation. This reaction is present in both superficial and deep parts of the corium. It appears to extend deeply around dermal appendages such as sweat glands, but also around nerve trunks. Compatible with sarcoidosis.

*Progress.*—He has been treated with calciferol 50,000 i.u. twice daily, from the end of October until the end of December 1953, and from then to the present with calciferol 50,000 i.u. thrice daily. All the older lesions are gradually clearing, and no new lesions have appeared in the past two months.

Twenty-five other cases were shown.

## CORRESPONDENCE.

*To the Editor, 'The British Journal of Dermatology'.*

SIR—,

## ITCHING PURPURA

With reference to Dr. Sneddon's letter (66 : 262) I am familiar with the descriptions of textile purpuric dermatitis so clearly given by the authors quoted. I should not otherwise have written "*No external factor, such as khaki clothing or application of chemicals, was concerned*" (p. 95). The almost predictable mode of progression, from the ankles to the waist, and simultaneously on the fronts and inner sides of arms and forearms, is incompatible with the distribution of any known garment or combination of garments. Rayon, nylon, cotton and woollen socks and stockings were all represented among the hose normally worn by these patients; several of the females, suspecting a contact factor, had gone without stockings for weeks, without affecting the course of the disease: several, again, had worn sleeveless frocks exclusively before and during the development of the disease and nevertheless showed the typical lesions on the forearms.

Dr. Sneddon also remarks that he could not discover from my figures whether I tested the capillary resistance in every case. May I refer him to page 99, where I wrote that this test had been done in 19 cases? I cannot state precisely in how many cases existing lesions were not intensified: as I wrote, this phenomenon occurred in 3 where the arm was affected. I am also unable to state how many of the 19 cases had apparently normal upper limbs; certainly several of them were normal and in all those the test was negative.

If speculation is now permitted (and I purposely refrained from this in my communication) I should agree with Dr. Sneddon's guess that a capillaritis is the basic disturbance, as it is alleged to be in some other forms of cutaneous haemosiderosis. But as pathological changes were not seen in the capillaries in my biopsy material (p. 99) I refrained from this somewhat wild surmise and remained silent, not upon a peak in Darien, but in the realms of gold where I live.

Yours faithfully,

L. J. A. LOEWENTHAL.

Johannesburg;  
August 1954.

*The Editor, 'The British Journal of Dermatology'.*

SIR,—When I drew attention in 1948 (*Brit. J. Derm.*, 60 : 71) to the occurrence of tropical lichenoid dermatosis (TLD) in patients taking Guy's pill, I encountered incredulity and some persiflage. Now during the last week I have seen two cases of TLD (one of them impressive enough to have suggested a differential diagnosis of Kaposi's idiopathic haemorrhagic sarcoma) in whom the only drug ingested had been the almost universal phenobarbitone. Can this mean that TLD has now achieved idiopathic status? Or what?

I am, Sir,

Yours, etc.,

J. H. TWISTON DAVIES.

Chester;  
October 1954.

*To the Editor, 'The British Journal of Dermatology'.*

SIR,—

I read with interest the article on "The nodular dermal allergides of Gougerot" by Gougerot and Duperrat in the current issue of the journal (p. 283). It seems probable that some members of the group of syndromes which I delineated as allergic cutaneous arteriolitis are similar to the conditions described by Gougerot and his school. I wish to point out, however, that my approach to the problems of these extremely polymorphous eruptions has been entirely different from that of the French authors mentioned above.

From the beginning it has been my conviction that the vascular changes must be seen as the common denominator in this group of dermatological affections. The concept of allergic cutaneous arteriolitis is therefore in large measure based on the histopathological substrate. In general, I am convinced of the fundamental value of clinical morphology in dermatological diagnosis; but the polymorphism and variability of the eruptions concerned has led me to wonder if a valuation predominantly based on clinical morphological characteristics might not prove to be unsatisfactory and I have therefore abandoned that method of approach.

With regard to the skin lesions I believe that a delineation of a limited number of clinical morphological characteristics more or less regularly occurring in this group of syndromes is preferable to a systematic analysis of their cutaneous picture. At the same time the clinical features (clinical course, etc.) the histopathological changes and the characteristics of the latter should be brought to the fore as equally valuable criteria. Likewise a number of rather ill-classified skin conditions (rheumatic purpura, purpura Schoenleini, etc.) could be grouped under the heading of allergic cutaneous arteriolitis in this way. As a result of this view attention is more especially focused on the general pathological significance of the skin eruptions concerned: as a logical consequence of my concept, moreover, attention may be drawn to a possible relationship of the syndromes discussed to other vascular diseases such as periarteritis nodosa and the vascular lesions in the allergic granulomatosis of Churg and Strauss.

I am, Sir,

Yours, etc.,

M. RUTER.

Department of Dermatology

University of Groningen (The Netherlands);

September, 1954.

## BOOK REVIEWS

## RECENT ADVANCES IN DERMATOLOGY.\*

ANOTHER milestone in dermatology is marked by the publication of this book after a lapse of nearly twenty years since the first edition. The accumulated literature is vast, diverse and often contradictory and the effort spent in sifting it is wholly admirable. The senior author has been happy in his choice of a colleague to help him with this second edition, in which, in spite of the apparently ever-growing need for hurry and condensation, there still lingers the atmosphere of wonder and meditation which gave charm to the first.

There are fourteen chapters, the headings of which include amongst others vascular disorders, affections of the reticular tissues, industrial dermatitis, and "miscellaneous"—in the latter are many important disorders which are awkward to classify, such as bullous eruptions, prickly heat, parasites, and some of the rarer syndromes such as Sjögren's and Behcet's. The last chapter is on "therapeutic agents", the choice of title suggesting a commendable realism in the authors' approach. The chapter on metabolism ranges wide, and includes much new information on mineral, carbohydrate, protein, lipid and sulphur metabolism, water and acid-base balance, hyaluronic acid and porphyrins. There is an excellent summary of the relationship of porphyrins to photosensitivity and blistering. In "the collagenoses" the relationship between lupus erythematosus, scleroderma and dermatomyositis is clarified, and the opposing views on their identity appraised. But it is refreshing also to find here and elsewhere the views of the authors candidly expressed.

On nervous and psychological influences affecting the skin so much has been written, accepted and rejected that it must be difficult to know where to start and what to omit. This chapter deals fairly and sensibly with controversial issues and opens with three pages of rather conflicting work on the innervation of the skin: the "psychological approach" and "psychological make-up" occupying thirty-odd pages, show considerable advance on the cruder ideas of the Freudian-dominated psychopathology of twenty-five years ago, and the changing views are treated historically. The threshold and other factors in itching are discussed in seven significant pages. The endocrine glands chapter includes a useful summary of indications for giving ACTH and adrenal steroids, but there is still much that is contradictory in the new work on the endocrines, and the same is true of the vitamins. These chapters are necessary, but rather depressing. Allergy proves more cheerful reading and the thirty-six pages given to it are well worth while for the account of much quite fundamental work. In fungous infections Emmons's work forms the basis of classification of the dermatophytes, which are listed, and for which the earlier synonyms are given. This is an interesting chapter, especially the six pages given to the discussion of scalp ringworm. The subjects of virus diseases and radiant energy have been brought up to date, and there is much new work in the latter field. The complexities of photosensitivity are reviewed and clarified, and as much as four pages are devoted to sunscreen barriers. The chapter on industrial dermatitis is excellent. The "miscellaneous" chapter includes several subjects of importance. Six pages go to pigmentation, and five to the bacteriology of the skin. Healing of surface epithelium and electron microscope studies are briefly covered, and prickly heat receives four pages

\* *Recent Advances in Dermatology* (2nd Edition). By W. N. GOLDSMITH and F. F. HELLIER (1954). London: J. & A. Churchill, Ltd. Pp. 461. Figs. 33. Price 42s.

with a well illustrated histopathology. In the chapter on therapeutic agents ten pages are given to ointment bases and fifteen to antibiotics.

This wealth of knowledge is made available in a concise, well-reasoned and tempting form. The reader's attention is held throughout by the logical sequence of facts and arguments and by the vitality of the writing. When a new theory is being discussed curiosity is awakened and one is forced to read on—evidence of the artist's touch. One feature which delighted your reviewer was the occasional apt citation of details of a single case, which by its nature illuminated and added piquancy to the discussion. Restraint and judgment has marked such incursions, which otherwise would be inadmissible.

It is unfortunate that the bibliography, though comprehensive, lists only a small proportion of the papers mentioned in the text. In the preface an offer is made to supply sources when required, but does this quite meet the case? As it is the volume is handy, but would the inclusion of a further sixty or more pages of references have spoilt its elegance or raised its price?

All the chapters are worth reading and the authors are to be congratulated on their industry, their discrimination and their high standard of presentation. Even the best-read dermatologist can hardly fail to learn much from this book, and most physicians, dermatologists or otherwise, will find therein great profit and pleasure.

C. H. W.

#### TAR DERMATOSES.\*

Controlled-temperature distillation of coal tar from such sources as coke ovens, gas plants, and oil distilleries produces five main distillates: Light oil, middle oil, heavy oil, anthracene, and pitch.

The primary carcinogenic chemicals are found in the heavy oil and anthracene fractions; derivatives of 1-2 benzantracene are responsible for cutaneous cancer and azo compounds (commercial dyestuff manufacture) cause hepatic and bladder growths.

The widespread use of pitch for housing, fencing, paint manufacture, asphaltting, patent fuels, wood preserving, electrical and cable work, railways and telegraph work, lens manufacture and in the fishing industry is a measure of the large number of people exposed to the risk of carcinoma in addition to those in tar distilleries, gas plants, coke ovens and in oil refineries. Dermatoses resulting from tar and pitch include tar burns, erythema ("smarts") from sun exposure, dermatitis, folliculitis and acne, keratinous cysts, transient summer melanosis and chronic persisting pigmentation and shagreen skin. Also may arise keratoses, papillomas (simple wart, pitch wart, soft papilloma) and epithelioma. The keratoplastic naphthalene and anthracene oil cause folliculitis, acne and comedones and these are precancerous. Melanosis is due to photosensitisation by the anthracene fraction and the chronic type is precancerous. Simple warts described as "typical acanthomas" usually regress spontaneously, but pitch warts are definitely precancerous.

Epithelioma is due to chronic irritation, and the majority of these occur on light-exposed skin. The effects of tar and sunlight are additive in producing the required amount of chronic irritation. The physical nature of light and other forms of radiant energy, skin penetration and photosensitivity are dealt with in great detail in this respect.

When coal tar is exposed to ultra-violet light the carcinogenic tar and oil fractions, e.g. anthracene, show characteristic fluorescence absorption bands which may be responsible for inducing sensitivity in basal cells.

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\* *Coal Tar and Cutaneous Carcinogenesis in Industry*. FRANK C. COMBES (1954). Springfield, Illinois, U.S.A.: Charles C. Thomas. Oxford: Blackwell Scientific Publications. Pp. 76, Figs. 25. Price 20s.

Such is the story told in brief. The monograph is a good one, it is eminently readable and the information from such a large and diverse industrial field is well and simply presented. It is short and concise without irrelevant matter, and although the chapter on the photodynamic action of light may seem long, a detailed understanding of this matter is required in order to appreciate the author's thesis. The illustrations, however, are very disappointing in their lack of clarity and definition.

In the chapter on petroleum some may not accept the statement that "the soluble cutting oils seldom cause folliculitis", although the association with other insoluble coolant oils is well known. Mention might perhaps have been made of molluscum sebaceum in pitch workers and its possible confusion with epithelioma; is the former perhaps related to the multiple simple acanthotic warts mentioned which retrogress spontaneously and drop off, though they "rarely in the elderly become squamous-celled growths"?

These are very minor criticisms, however.

Somerset Maugham, discussing authors in *The Moon and Sixpence*, draws the moral that "the writer should seek his reward in the pleasure of his work and in release from the burden of his thought, and, indifferent to aught else, care nothing for praise or censure, failure or success". The author must have enjoyed writing this monograph and the reader will be much rewarded in the reading.

G. A. H.

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## THE BRITISH ASSOCIATION OF DERMATOLOGY

THE Thirty-fifth Annual Meeting of the Association is to be held in Birmingham on 7, 8 and 9 July 1955, under the Presidency of Dr. B. C. Tate.

The main subjects for discussion will be: "Skin Hazards in Industry" and "Fungous Diseases of the Skin".

Those wishing to read short papers on these or other subjects should communicate with the Honorary Secretary, Dr. G. B. Dowling, 24 Wimpole Street, London, W.1.

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## CURRENT LITERATURE.

**CHRONIC DISCOID LUPUS ERYTHEMATOSUS. TREATMENT WITH DARAPRIM AND CHLOROQUINE DIPHOSPHATE (ARALEN).** M. J. TYE, B. L. SCHIFF, S. F. COLLINS, G. R. BALER and B. APPEL. (1954) *New Engl. J. Med.*, **251**, 52.

Five patients with chronic discoid lupus erythematosus were treated with daraprim, an anti-malarial drug, without improvement.

Twenty-six were treated with chloroquine diphosphate (Aralen); of these the lesions disappeared in thirteen and improved in the remainder.

Three patients had toxic symptoms; headache in one, nausea and dizziness in another, and nausea and dizziness with diplopia in the third. Laboratory findings were normal in all.

Dosage began with 3 or 4 tablets (0.25 g.) daily and was reduced to 1 tablet daily as improvement occurred.

A. D. P.

**HUMAN DANDER AND ATOPIC DERMATITIS.** B. MAGNUSSON. (1954) *Acta allergol.*, **7**, 294.

Intimate relations with his housekeeper were followed by exacerbations of a patient's atopic eczema. Patch tests with her hair produced a positive reaction consisting of follicular papules on an erythematous base, and the patient was believed to be allergic to her epithelium. Weakly positive reactions were, however, given by 4 out of 17 patients who had presumably had no previous sensitizing dose.

H. T. H. W.

**INVESTIGATIONS INTO TRICHOPHYTON ALLERGY.** E. RAJKA. (1954) *Acta allergol.*, **7**, 326.

Patients giving urticarial reactions to trichophytin are not uncommon. Specific reagins may be detected in the blood serum and a positive Prausnitz-Kuestner reaction can frequently be obtained.

H. T. H. W.

**THE EFFECT OF WASHING WITH SOAP AND WITH A DETERGENT ON THE 4-HOUR SEBACEOUS SECRETION IN THE FOREHEAD.** J. E. KIRK and H. EFFERSOE. (1954) *J. invest. Derm.*, **22**, 257.

It does not make any difference. These experiments were carried out on old people in an infirmary.

J. H. T. D.

**SEROLOGIC REACTIONS IN PEMPHIGUS VULGARIS. AN ATTEMPT TO DETECT AUTO-ANTIBODIES OR A VIRUS IN THE BLOOD SERUM OR BLISTER FLUID.** D. KOPEL. (1954) *J. invest. Derm.*, **22**, 261.

Six serological tests based on the agglutination of natural, sensitized, or trypsinized RBC with rabbit antihuman serum were employed. No antibodies were detected.

J. H. T. D.

**MAGNAMYCIN IN THE TREATMENT OF GRANULOMA INGUINALE.** H. M. ROBINSON and M. M. COHEN. (1954) *J. invest. Derm.*, **22**, 263.

Six successes, no failures.

J. H. T. D.

**CONTAMINATION OF FUNGUS CULTURES BY TYROPHAGUS LINTNERI.** R. W. JONES and R. LOHRMAN. (1954) *J. invest. Derm.*, **22**, 265.

These mites can only be prevented from walking round a bacteriological laboratory with spores adhering to their hairy legs by putting a ring of mineral oil around each piece of apparatus.

J. H. T. D.

**EXPERIMENTAL MILIARIA IN MAN. V. THE EFFECT OF PORAL CLOSURE ON THE SECRETORY FUNCTION OF THE ECCRINE SWEAT GLAND.** W. B. SHELLEY. (1954) *J. invest. Derm.*, **22**, 267.

Aluminium chloride does not directly inhibit secretion. Unless escape of the sweat is allowed by rupture of the duct, poral closure brought about by the local action of alum leads to suppression

of secretion by the rising intra-luminal pressure. In this experiment the secretory activity of the sweat coil is inferred from its glycogen content. J. H. T. D.

**INFRARED SPECTROSCOPIC STUDIES OF FUNGI.** E. P. CAWLEY, C. E. WHEELER, H. BOATWRIGHT, D. W. SMITH, H. M. RANDALL and C. S. LINGAMFELTER. (1954) *J. invest. Derm.*, **22**, 273.

Practically all organic compounds have a characteristic infrared spectrum and the spectrum of a mixture is the sum of the individual spectra of its components.

The resinous material extracted from cultures with methyl alcohol and chloroform was examined in order to see if there were chemical differences between individual strains of various dermatophytes. The spectrograms were fairly constant for *M. lanosum* and *M. fulvum*; but there were conspicuous differences among six different strains of *T. gypsum* corresponding no doubt in part to different capacities for producing pigment. J. H. T. D.

**CHEMICAL ANALYSIS OF THE CAPSULAR SUBSTANCE OF CRYPTOCOCCUS NEOFORMANS.** J. M. EINBINDER, R. W. BENHAM and C. T. NELSON. (1954) *J. invest. Derm.*, **22**, 279.

The techniques of extracting the capsule material from suspensions of the microbe and of determining the nature of its carbohydrate constituents are fully described. J. H. T. D.

**ON THE DEVELOPMENT OF EPIDERMAL METHYLCHOLANTHIC TUMOURS IN MICE RECEIVING CORTISONE.** R. W. PICCAGLI, F. HERRMANN, L. FRANK, M. J. ROTHSTEIN, S. D. MORRILL and M. B. SULZBERGER. (1954) *J. invest. Derm.*, **22**, 317.

Though the work of previous investigators would hardly permit any prediction as to the probability or direction of its effect, cortisone might be expected to influence carcinogenesis in one or more ways, for example by atrophy of covering epithelium or sebaceous glands; follicular hyperkeratosis; by suppression or increase of mitosis in response to damage; modifications of the physicochemical basis of spreading, of the initial inflammatory response to the carcinogen; by interference with the development of protective cell infiltrations.

Tumours and an increased tendency for them to develop in biopsy scars were more frequent in mice receiving cortisone. J. H. T. D.

**HISTOCHEMICAL AND ULTRAVIOLET MICROSCOPIC STUDIES OF CHRONIC DERMATOSES AND OF THE CORIUM MEMBRANE.** A. HOLLANDER, S. C. SOMMERS and A. E. GRIMWADE. (1954) *J. invest. Derm.*, **22**, 335.

The freeze-drying method of fixation and preparation for paraffin or carbowax embedding is recommended for histochemical studies. It has enabled the authors to obtain a very clear view of the highly controversial basement membrane which they now consider to be part of the corium.

But none of the eight staining techniques here employed showed any specific alteration of nucleoprotein, protein, carbohydrate, glycoprotein, fat or phospholipoid peculiar to psoriasis, eczema or lichen simplex. By means of an ingenious system of ultra-violet microphotography, however, in which the hues of the invisible spectrum are arbitrarily translated into terms of red blue and green, it was possible to make out that keratin in psoriasis resembled keratin treated *in vitro* with mucinase derived from the stools of patients with ulcerative colitis. J. H. T. D.

**NUTRITIONAL STUDIES OF THE DERMATOPHYTES WITH SPECIAL REFERENCE TO THE RED-PIGMENT-PRODUCING VARIETIES OF TRICHOPHYTON MENTAGROPHYTES.** M. SILVA and R. W. BENHAM. (1954) *J. invest. Derm.*, **22**, 285.

Emmons's simplified classification of the ringworm fungi is widely accepted. *T. interdigitale* was doubtless no more than a *T. gypsum* which had undergone pleomorphism in the enervating climate of the gum-boot; and most of us have had the experience of obtaining different looking colonies at different times in what must clearly have been the same infection with that which we now allow the botanist to call *T. mentagrophytes*.

All the same the clinician continues to observe variations in virulence and parasitical predilection which seem to him closely bound up with differences in pigmentation and superficial texture of the colonies formed in standard media by the organisms isolated from his cases.

The authors demonstrate that their selected varieties of *T. mentagrophytes* not only preserved their cultural morphology and pigmentary function in spite of variations in the supply of nitrogen, but that they constantly produced, in guinea pigs, lesions that were both clinically and microscopically distinct. J. H. T. D.

**A METHOD FOR THE STUDY OF THE INTERMEDIARY CARBOHYDRATE METABOLISM OF EPIDERMIS. I. OXIDATION OF ACIDS OF THE CITRIC ACID CYCLE.** R. D. GRIESEMER and E. GOULD. (1954) *J. invest. Derm.*, **22**, 299.

There is plenty of information about the intracellular metabolism of carbohydrate—the final stage in the transformation of all nutriment into energy—in kidney, liver muscle, and other tissues having ample respiration. But though there may have been some isolated manometric studies of skin slices, healthy and psoriatic, the low  $QO_2$  of skin and difficulty of standardizing the active cellular content of samples may well have seemed an insuperable obstacle.

This work, which has borne fruit in a useful and attractively presented summary of the basic knowledge required for this sort of research, was done on rat epidermis. It had to be shaved off with a half-open safety razor and ground into a pulp in order to release the intracellular enzymes.

One might perhaps have thought that a keener demand existed for information about more or less undamaged stretch-separated human epidermis, but the authors provide convincing reasons for the choice of every detail of their method.

J. H. T. D.

**SORPTION OF AMINO ACIDS AND OTHER SUBSTANCES BY AMBERLITE ION EXCHANGE RESINS.** F. M. THURMON, B. OTTENSTEIN, N. F. BONCODDO and M. J. BESSMAN. (1954). *J. invest. Derm.*, **22**, 349.

Remarkable chemical feats of denaturing and purification are possible by means of ion-exchange resins and one can at least see hopeful possibilities in the fields of foot powder and axillary deodorants. Ion-exchange resins can also be made to inhibit *in vitro* the growth of microbes, presumably by extracting essential salts from the media. Provided then that it does not sensitize, "rep. amberlite" may perhaps show an amber light to those tiresome little cocci of "secondary infection".

J. H. T. D.

**THE BACTERIOLOGIC FLORA IN SEBORRHOIC DERMATITIS.** E. A. PACHTMAN, E. E. VICHER and M. J. BRUNNER. (1954) *J. invest. Derm.*, **22**, 389.

Seborrhoeic dermatitis is defined as a "low-grade inflammatory disease of the sebaceous gland-bearing areas of the skin".

Microbes were collected from both normal skins and surfaces affected with seborrhoeic dermatitis in similar numbers and variety. Microbial counts made at different times from identical sites in the same individual showed differences many times greater than the average difference between normal and diseased.

*Micrococcus pyogenes* var. *aureus* was infrequently recovered and when present did not exceed 5% of the bacterial population.

Persons using hexachlorophene soap and shampoo had significantly lower counts—occasionally zero—but such suppression could not be related with improvement of the seborrhoea. Selenium sulphide on the other hand improved the skin condition without influencing the bacterial count.

J. H. T. D.

**BLUE NAEVUS AND ITS DISTINCTION FROM MONGOLIAN SPOT AND THE NAEVUS OF OTA.** C. S. DORSEY and H. MONTGOMERY. (1954) *J. invest. Derm.*, **22**, 225.

A small proportion of blue naevi have central islands of cells resembling those of ordinary soft moles. They can, however, be distinguished from naevus cells by staining with silver nitrate, which reveals a network of fibrils adherent to extremely thin dendritic processes containing tiny granules of melanin.

Three cases of metastasizing blue naevi are here reported and two cases of the blue naevus of Ota. This can be described as a large mongolian spot located in the maxillary area and involving the eye, in which condensations may appear and subsequently develop malignant characters.

J. H. T. D.

**CRITICAL EVALUATION OF THE SO-CALLED "JUNCTION NEVUS".** S. W. BECKER. (1954) *J. invest. Derm.*, **22**, 217.

The author distinguishes quiescent flat moles (naevus spilus), the actively growing flat moles occasionally seen in children, and the lentigo maligna of adults. He deprecates the use of the fashionable but meaningless term "junction naevus" as a source of unnecessary confusion.

Malignant cells arise *de novo*, not from proliferating benign cells, and they are supposed to be distinguishable by three features. (1) Nuclei and cell bodies are larger than those of (2) the very largest) naevus cells: they may be oval or fusiform (3) like the oat-celled naevus) and their pigment

is present in the form of small particles all of the same size in any given cell. (2) Malignant cells work their way up through the epidermis and are shed in the scales. (3) A round-cell infiltrate occurs in the superficial part of the dermis. J. H. T. D.

**THE HISTOCHEMICAL RESPONSE OF THE HUMAN EPIDERMIS TO CONTROLLED INJURY: GLYCOGEN.** W. C. LOBITZ and J. B. HOLYOKE. (1954) *J. invest. Derm.*, **22**, 189.

These fundamental experiments which required the co-operation of healthy subjects in a business having no sentimental or nosolatrous appeal whatever, are of the greatest intrinsic interest and of quite incalculable scientific value. For such phenomena as these, having once been adequately observed and described in man, can now be studied in detail in animals. Biopsies taken immediately, 4 hours, 8, 16, 24 and 48 hours after the horny layer has been stripped by the Pinkus scotch tape method revealed the striking changes here described. Glycogen ordinarily absent from the epidermis quickly makes its appearance in the basal layer and deeper parts of the rete within 8 hours. Presumably it supplies the energy for its regeneration. J. H. T. D.

**CAPILLARY MICROSCOPY IN THE DIAGNOSIS OF DERMATOLOGIC DISEASES.** O. GILJE, R. KIERLAND and E. J. BALDES. (1954) *J. invest. Derm.*, **22**, 199.

For details of technique we are referred to other papers but the study clearly needs much dexterity and experience. This paper deals solely with appearances of the capillary loop supposed to be characteristic of different diseases. J. H. T. D.

**NAEVOXANTHO-ENDOTHELIOMA. A BENIGN XANTHOMATOUS DISEASE OF INFANTS AND CHILDREN.** R. NOMLAND. (1954) *J. invest. Derm.*, **22**, 207.

We are glad to know this because we supposed we hadn't enough information even to justify our calling it a syndrome. But the missing data are not to be found in this paper. J. H. T. D.

**CUTANEOUS SMEARS: A DIAGNOSTIC AID IN CERTAIN MALIGNANT LESIONS OF THE SKIN.** G. T. WILSON. (1954) *J. invest. Derm.*, **22**, 173.

Fresh from biopsy and before immersion in fixative the sample is cut in half, gently pressed or smeared on the slide, air dried, and stained with Wright.

In 176 cases comprising 52 distinct types of skin lesion the smears were compared with the section. In 135 they provided no information. In 41 a diagnosis was possible from the smear alone, in 15 a better diagnosis than that provided by the section.

The method, by supplying an undistorted close-up view of some of the cells in the section, is of value in the study of malignant diseases of the reticulo-endothelial and haematopoietic systems. J. H. T. D.

**THE EPIDERMAL ECCRINE SWEAT DUCT UNIT: A MORPHOLOGIC AND BIOLOGIC ENTITY.** W. C. LOBITZ, J. B. HOLYOKE and W. B. MONTAGNA. (1954) *J. invest. Derm.*, **22**, 157.

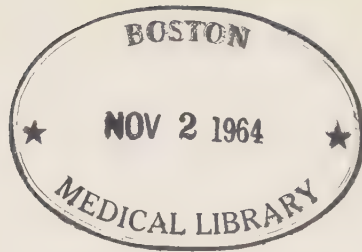
A conception of the organic individuality of the sweat apparatus is based on the differential histochemical reactions with McManus, toluidine blue, etc., of those parts of the duct that are in relation to the covering epithelium. J. H. T. D.

**A SIMPLE COLOUR FILTER AS AN AID IN EVALUATING THE SUPERFICIAL VENOUS PATTERN.** E. M. FARBER, J. MCCLEARY and E. E. BATTS. (1954) *J. invest. Derm.*, **22**, 253.

With the ordinary radioscopists visual-purple economizer held in front of the camera and the exposure increased by how much they do not say, reflections are reduced and the superficial veins show up better. J. H. T. D.

**LUPUS ERYTHEMATOSUS PROFUNDUS.** S. IRGANG. (1954) *Ann. Derm. Syph., Paris*, **81**, 246.

The author marshalls the evidence in favour of the condition he originally described in answer to the recent criticism of Pautrier. F. F. H.



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*Made and printed in Great Britain for  
H. K. Lewis & Co. Ltd., by  
Adlard & Son, Ltd., Bartholomew Press, Dorking.*







